

# AFFECTIVE FORECASTING

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It must be troubling for the god who loves you  
To ponder how much happier you'd be today  
Had you been able to glimpse your many futures.

—Dennis (2001, p. 72)

Foreseeing the future is one of the most appealing of all psychic powers. Who has not dreamed of making millions by predicting which new offering on Wall Street will be the next Microsoft and whether the Red Sox or Phillies will win the World Series? Seeing into the future would bring many advantages other than fattening our wallets, such as eliminating all decision-making angst. Rather than worrying about whether we are best suited for a career as a lawyer or an interior designer, whether we should marry Sam or Harry, or whether we should buy our neighbor's 1992 Volvo, we could simply glance into our crystal balls and see how these various options would pan out.

People do not have crystal balls, of course (at least not accurate ones) and thus must prognosticate as best they can, based on what they know in the present. There is a great deal of research on how people make predictions about the future, including decision making under uncertainty (e.g., Kahneman & Tversky, 2000; Gilovich, Griffin, & Kahneman, 2002; Nisbett & Ross, 1980), the accuracy of people's predictions about their future behavior (e.g., Osberg & Shrauger, 1986; Sherman, 1980; Wilson & LaFleur, 1995), the effects of temporal perspective on prediction (e.g., Trope & Liberman, in press), and optimistic biases in self-prediction (Armor & Taylor, 1998; Taylor & Brown, 1988; Weinstein, 1980).

Until recently virtually all research on prediction has concerned people's ability to anticipate the occurrence of future external events (e.g., "will the

price of Microsoft stock go up or down?") or their own behavior (e.g., "am I likely to get divorced in the next 10 years?"). A crucial form of prediction has been overlooked, namely people's ability to forecast their own feelings. What people really want to know about the future, we maintain, is what their level of happiness and well-being will be, and many questions about future events and behaviors are really proxies for questions about these affective states. People want to be able to predict whether they will get married or divorced or have children because they believe that such life events are crucial determinants of their happiness. They want to know the future price of Microsoft stock so that they can make money, which they believe will increase their happiness. The pursuit of happiness is one of the most fundamental of all human motives, and if people had crystal balls in good working order, they would peer into them most often to try to achieve that goal.

How successful would people be at achieving happiness? This crucial question depends on whether people can predict accurately which events will make them happy, by how much, and for how long. That is, predictions about future events are good proxies for predictions about feelings only if people know for sure how much happiness these events will bring and how long that happiness will last. Will a cool drink be more refreshing than another helping of guacamole? Will it be more enjoyable to go to *La Traviata* at the Met or watch a soap opera on TV? Will marrying Sam bring more or less happiness, in the long run, than living life as a single parent?

In recent years several researchers have begun to investigate *affective forecasting*, namely people's predictions about their future feelings (e.g., Baron, 1992; Gilbert, Driver-Linn, & Wilson, 2002; Gilbert & Wilson, 2000; Kahneman, 1994; Kahneman & Snell, 1990; Linville & Fischer, 1991; Loewenstein & Frederick, 1997; Loewenstein, Nagin, & Paternoster, 1997; Loewenstein & Prelec, 1993; Loewenstein & Schkade, 1999; Mellers, 2000; Mellers & McGraw, 2001; Snell, Gibbs, & Varey, 1995; Wilson, Centerbar, & Gilbert, in press; Zeelenberg, van Dijk, Manstead, & van der Pligt, 2000). Most of the early work in this area measured people's forecasts but not their actual emotional responses, and thus did not assess forecasting accuracy. Increasingly researchers have assessed accuracy by measuring both predicted and experienced emotional responses, permitting the systematic study of errors in affective forecasting.

### I. Types of Affective Forecasts and Errors

Affective forecasts can be broken down into four components: predictions about the *valence* of one's future feelings, the *specific emotions* that will be experienced, the *intensity* of the emotions, and their *duration*. People can be

accurate or inaccurate in predicting each of these facets of emotional experience.

### A. PREDICTING VALENCE

Life would be difficult indeed if people were mistaken about the valence of future events. People would leave the house wearing down coats on hot summer days, thinking that bundling up would make them comfortable. Customers in music stores would have no idea what type of music to shop for and once they got home they would often discover that they hated the recording that they thought they would love. People would fail to anticipate that a full body massage is a pleasant experience whereas a full body beating is not, or that lemonade with sugar tastes better than lemonade without.

We do not mean to imply that people always make correct predictions about valence. When experiencing something for the first time, such as the Thunderbolt Roller Coaster at an amusement park, people might discover that what they thought would be thrilling is more like a trip through the underworld. In general, however, people make accurate predictions about which side of the neutral point their emotional experiences will fall, especially if they have had experience in that domain. In one study, for example, Wilson, Wheatley, Kurtz, Dunn, and Gilbert (2002) staged a simulated dating game, in which college students competed with a same-sex student for a hypothetical date with an opposite-sex student. Experiencers were randomly assigned to win or lose the date, after which they rated their mood. Forecasters estimated what their mood would be if they won or lost the date. Without exception, all forecasters estimated that they would be in a better mood if they won than if they lost, and indeed, experiencers who won were, on average, in a better mood than experiencers who lost. Forecasters overestimated *how* positive or negative they would feel—a point we will return to shortly—but for present purposes, we note that they were accurate about the valence of winning versus losing.

### B. PREDICTING SPECIFIC EMOTIONS

Even if people correctly predict the valence of their feelings (e.g., that they will feel negatively), they still need to identify the specific emotions they will experience (e.g., disgust, anger, fear, or a blend of all three). They probably are able to do so much of the time; people have a pretty good idea of what will disgust them and do not mistakenly think that these events will cause anger or fear instead. People know that watching a comedy is more likely to

produce mirth than pride, and that watching one's favorite team win a championship is more likely to result in joy than fits of laughter. Robinson and Clore (2001), for example, gave people written descriptions of a series of emotion-provoking pictures and asked them to predict on 20 emotion scales how the actual pictures would make them feel. Not surprisingly, the forecasters were generally correct about which emotion they would experience, compared to people who actually saw the pictures. They correctly estimated, for example, that a snarling wolf would trigger more fear than a picture of kissing lovers would, and that a photo of a filthy toilet would trigger more disgust than would the snarling wolf.

Emotions can occur in complex blends, of course, and people might fail to anticipate the precise nature of the mix they will experience. We suspect that this is especially true for events that produce a combination of positive and negative emotions. People often view the future in a simplistic manner, assuming that events will cause primarily good or bad feelings, rather than a rich mixture of both. When imagining their graduation day, for example, college students might focus on the feelings of joy and pride they are likely to experience, overlooking the fact that they are likely also to feel sadness about leaving their friends and apprehension about the future (Larsen, McGraw, & Cacioppo, 2001).

As compelling as this idea sounds (at least to us), there is not yet much evidence for it. In the Wilson, Wheatley, Kurtz, Dunn, and Gilbert (2002) dating game study, for example, forecasters predicted how positive/negative, happy, sad, frustrated, calm, and agitated they would feel if they won or lost the date, and experiencers rated their actual feelings on these same scales. There was no evidence that forecasters' predictions were less complex than experiencers' reports of their actual experiences; factor analyses generally revealed the same number of factors for predictions as experiences. Similarly, Robinson and Clore (2001) performed cluster analyses of people's predicted emotional reactions to the descriptions of emotion-provoking pictures, and found that the structure of people's predicted reactions matched closely the structure of people's actual reactions to the pictures.

Liberman, Sagristano, and Trope (2002), on the other hand, found that people have overly simplistic, schema-driven views of their reactions to emotional events when thinking about the distant future (as opposed to the near future). When imagining what a good day would be like tomorrow, for example, participants described a series of events that would be mostly positive but that would be tempered by some negative occurrences (e.g., "I'll have fun going out with my friends but I also have a test in my chemistry class"). When imagining what a good day will be like in a year, participants described a more uniform set of positive events, untempered by anything negative (e.g., "I'll have fun going out with my friends and we'll hear some

good music"). These findings suggest that people's forecasts might be more realistic for events that will happen soon but overly simplistic for events far in the future.

People's predictions also might be overly simplistic when they anticipate events that cause more ambivalence than the ones we or Robinson and Clore (2001) examined. Winning or losing a dating game, for most college students, produces straightforward feelings of joy or disappointment, and a picture of a snarling wolf probably causes little ambivalence. Other events, such as graduating from college, produce a more complex blend of emotions, and people might not be very good at predicting the precise mixture that will occur.

Further, people might misconstrue the nature of complex social situations when imagining them in advance, and thereby mispredict the dominant emotion that they will experience. Woodzicka and LaFrance (2001) described a job interview to women and asked them how they would feel if they were asked a specific set of sexually harassing questions. The women predicted that their predominant emotional reaction would be anger and that they would experience little fear. When women were actually interviewed for a job and asked the harassing questions, however, their predominant emotional reaction was fear and relatively few reported anger. Failing to appreciate the nuances of complex social situations is, we suspect, the major cause of mispredicting which emotions people will experience, a point we will return to later.

### C. PREDICTING INTENSITY AND DURATION

Often people predict correctly the valence of their emotional reactions ("I'll feel good if I get the job") and correctly predict the specific emotions they will experience (e.g., joy). Even when achieving such accuracy, however, it is important for people to predict what the initial intensity of the reaction will be (how much joy they will experience) and the duration of that emotion (how long they will feel this way). It is useful to know that we will feel happy on our first day at a new job, but better to know how happy and how long this feeling will last, before committing ourselves to a lifetime of work as a tax attorney. It is helpful to know that it will be painful to end a long-term relationship, but better to know how painful and whether the pain will last half a second or half a decade.

As we will soon document, numerous studies have found that people overestimate the impact of future events on their emotional lives. We initially referred to this as a *durability bias*, defined as the tendency to overestimate the duration of one's future emotional reactions (Gilbert,

Pinel, Wilson, Blumberg, & Wheatley, 1998). It is now clear that this term can be misleading, because overestimating the impact of future emotional events can involve a misprediction of several different aspects of emotional experience.

Figure 1 depicts an experienced emotional reaction to an event and people's hypothetical predictions about their reactions. To predict correctly how they will feel some time after the event occurs, people would need to know the acceleration of their initial emotional reaction (the rate of increase in the emotional reaction after the event occurs), the peak level of intensity of their reaction, and the rate of deceleration (i.e., the rate of the return to baseline). The dotted line in Fig. 1 represents a prediction error on all three components: People overestimate the rate of acceleration, overestimate the peak level of intensity, and underestimate the rate of deceleration. Many other forms of error are possible as well; for example, people could make correct predictions about the rate of acceleration and deceleration, but underestimate the peak intensity. Or, they could be correct about the peak intensity but underestimate the rate of deceleration. Further, emotional reactions could occur in more complex patterns than depicted in Fig. 1; for example, they could oscillate in response to environmental reminders of the event. To make a correct prediction, people would need to anticipate these complex response patterns.

When people's emotions are measured at only one point in time following an emotional event, it is impossible to tease apart the precise nature of any error they have committed. If predicted and experienced emotions were measured only at Time 3 in Fig. 1, for example, it would be clear that people made a prediction error, estimating that their emotional reaction at that point would be more intense than it in fact was. Whether this error was due to an overestimation of the initial intensity of the experience, an error about how quickly the reaction would dissipate, or some other error about the

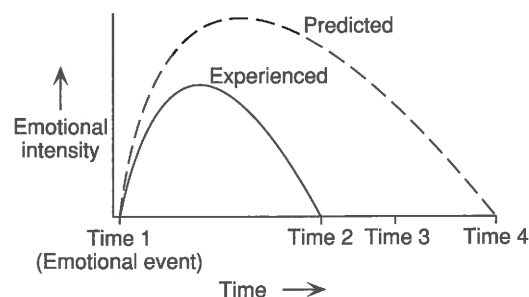


Fig. 1. The hypothetical time course of predicted and experienced emotion.

time course of their emotions would be unknown. Wilson, Wheatley, Meyers, Gilbert, and Axsom (2000), for example, found that college sports fans overestimated how happy they would be the day after their favorite team won a football game. Fans might have correctly predicted exactly how happy they were immediately after the game, but have been wrong about how long this feeling would last. Alternatively, they might have been accurate about the rate of deceleration of their emotional reactions to games, but overestimated how happy they were initially. Or, they might have made both errors, underestimating intensity and overestimating deceleration.

We will refer to mispredictions of this sort as an *impact bias*, defined as the tendency to overestimate the enduring impact that future events will have on our emotional reactions (Gilbert, Driver-Linn, & Wilson, 2002). This term is intentionally broad, covering a number of more specific errors (e.g., overestimating initial intensity and overestimating duration). It would be quite interesting, of course, to investigate the temporal structure of people's emotional reactions, compare this to their predictions, and isolate the various components of the impact bias. In some studies researchers have measured affect at more than one point in time, allowing some insight into its time course. However, there are several reasons why it is difficult to focus on the precise time course of affective forecasts and emotional reactions. First, the measurement problems associated with the time course of affective response are not trivial (Larsen & Fredrickson, 1999). It is difficult enough to ask people to predict and report their emotional reactions at one or two points in time, but to have them make the number of predictions required to estimate the velocity and acceleration of their responses is challenging (Hsee & Abelson, 1991).

Second, the impact bias is an important phenomenon regardless of which elements compose it in any particular instance. Whether people overestimate how good or bad they will feel, overestimate how quickly those feelings will arise, or underestimate how quickly they will dissipate, the important point is that they overestimate how powerfully the event will impact their emotional lives. Put differently, what matters to us is whether an emotion is more or less intense than predicted at some point after an emotional event has occurred, and in most cases, it does not matter whether this misprediction is due to a mistaken estimate of acceleration, peak magnitude, or deceleration. We are interested, of course, in the psychological processes that make people's emotions different from what they expected at different time points after the event (from a few seconds to a few years or more). We have focused on a number of the mechanisms responsible for the impact bias and other kinds of prediction errors, which we will review shortly.

#### D. MEASUREMENT AND VALIDITY

Most studies of affective forecasting use self-report scales, such as ones that ask people to report how happy they are now or (or will be) "in general these days." These measures have been found to have good psychometric properties (Andrews & Robinson, 1991; Fordyce, 1988). When researchers have included more extensive measures (e.g., the "Satisfaction with Life Scale"; Diener, Emmons, Larsen, & Griffin, 1985; the "Affectometer"; Kammann & Flett, 1983), they have found healthy correlations between one-item measures of happiness and multiitem measures (Gilbert et al., 1998). Other studies have included measures of more specific hedonic states, using such instruments as the Positive and Negative Affect Schedules (PANAS; Watson, Clark, & Tellegen, 1988); the Multiple Affect Adjective Check List (MAACL; Zuckerman & Lubin, 1965), or emotion words specific to an individual study.

Self-report scales such as these have a proven track record of reliability and validity and allow a close comparison between predicted and actual ratings on the same scales. Although it is possible that these indices are susceptible to self-presentational concerns, perspective shifts, and demand characteristics, there are a number of reasons to doubt that these sources of bias are a problem in most affective forecasting studies. For example, many of the findings we will encounter cannot be explained by the desire to put one's best foot forward, such as the fact that people often report feeling less positively than they predicted they would. If people were trying to present themselves in a positive light, it is unclear why they would admit to feeling negatively, more so than they had predicted.

Further evidence for the validity of self-report measures of affect comes from studies that used behavioral as well as self-report indices. A version of the Wilson, Wheatley, Kurtz, Dunn, and Gilbert (2002) dating game study, for example, included both types of measures. Forecasters predicted how they would feel if they lost the dating game, on standard mood scales. Experiencers found out that they had, in fact, lost the dating game and then rated their mood on the same scales. Forecasters predicted that they would be significantly less happy after a loss than experiencers actually were. The important point for present purposes is that Wilson et al. (2002) also included a behavioral forecasting measure. All participants were given the opportunity to take a mood-enhancing herbal drug, ostensibly as part of a pilot program to ensure that participants left psychology studies in the same frame of mind as when they first arrived. Forecasters chose the dosage of drug they would want to take if they found out that they were not chosen for the date, whereas experiencers found out that they were not chosen and then selected the dosage of drug they wanted to take. Consistent with the results

on the mood scales, forecasters selected a significantly higher dosage of the drug than did experiencers.

In addition to increasing our faith in the validity of self-report scales, results such as these demonstrate that affective forecasts are often translated into social behaviors of considerable interest. People base important decisions on affective forecasts, such as the types of consumer goods they want to purchase in the future (Gilbert, Gill, & Wilson, 2002; Read, Loewenstein, & Kalyanaraman, 1999; Read & van Leeuwen, 1998; Simonson, 1990) and which gambles they prefer to take (Mellers & McGraw, 2001; Mellers, Schwartz, & Ritov, 1999; Read et al., 1999). We assume that many other important life decisions are based on affective forecasts as well, such as whom to marry and what career to pursue. More broadly, happiness and subjective well being are highly valued states in virtually all cultures that predict many positive outcomes in life, such as marital satisfaction, job success, good health, and longevity (Danner, Snowdon, & Friesen, 2001; Diener, 2000). Thus, it would seem to be important for people to be able to predict their future levels of happiness.

#### E. THE IMPACT BIAS

The most prevalent error found in research on affective forecasting is the impact bias, whereby people overestimate the impact of future events on their emotional reactions (Buehler & McFarland, 2001; Crawford, McConnell, Lewis, & Sherman, 2002; Gilbert, Brown, Pinel, & Wilson, 2000; Gilbert et al., 1998; Mellers & McGraw, 2001; Mitchell, Thompson, Peterson, & Cronk, 1997; Rachman, 1994; Rachman & Arntz, 1991; Robinson & Clore, 2001; Schkade & Kahneman, 1997; Schmidt, Jacquin, & Telch, 1994; Sieff, Dawes, & Loewenstein, 1999; van Hout & Emmelkamp, 1994; Wilson et al., 2000, in press). The impact bias has been found in a variety of populations (e.g., college students, professors, sports fans, dieters, vacationers, snake phobics, people taking medical tests), with a wide range of emotional events (e.g., romantic breakups, personal insults, sports victories, electoral defeats, parachute jumps, failures to lose weight, reading tragic stories, and learning the results of pregnancy and HIV tests). Although the impact bias is by far the most common finding in the affective forecasting literature, a few studies have found an underprediction of the impact of one's future affective reactions. There are also cases of the misprediction of specific emotions. We will note these exceptions as we discuss the process by which people make affective forecasts and possible sources of error.

## II. The Process of Affective Forecasting and Sources of Error

Figure 2 depicts the process of affective forecasting (shown in the boxes). The left of the dotted line represents the time at which forecasts are made, whereas the right of the dotted line represents people's future experiences at the predicted point in time. As seen in the figure there are several sources of error (shown in the circles), which we will discuss in turn.

### A. CONSTRUAL

When people think about how they will feel when a future event occurs, they first must bring to mind a representation of that event. If people have experienced the event many times before (e.g., commuting to work), they can form such a representation effortlessly by recalling a prototype or exemplar of it. When people think about events that they have not experienced before, such as the birth of a child, getting married, or attending a party at the house of a new acquaintance, they need to construct a representation of what the event is likely to entail.

The first source of error is the *misconstrual problem*, whereby people mistakenly imagine the wrong event. When asked how she will feel at the birth of her first child, a woman might imagine a trouble-free, natural delivery followed by a quiet period of intimate bonding with the baby. What happens instead is 24 hours of painful labor, a Cesarean section, and intrusive visits from in-laws armed with video cameras. People do not have

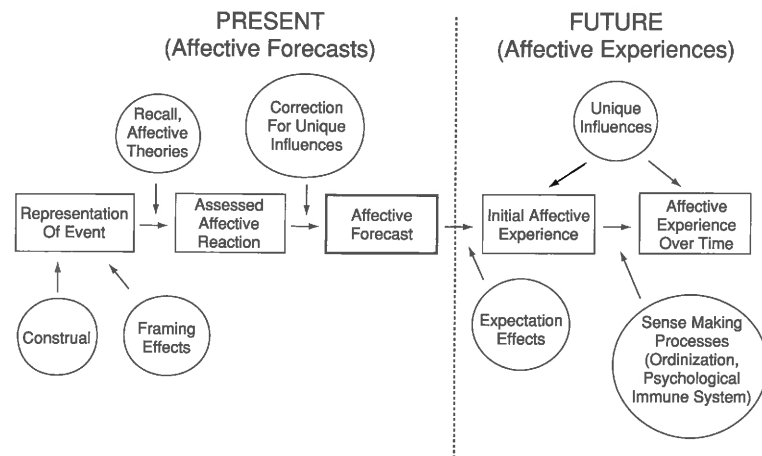


Fig. 2. Sources of influence and bias on affective forecasts.

crystal balls and the future often unfolds in ways they do not expect, producing discrepancies between their predicted and actual feelings.

Because such unexpected outcomes are common, one might think that people would be reticent about making confident predictions about future behavior and feelings. "I'm not sure how I'll feel when my baby is born," an expectant mother might say, "because the birth could unfold in any number of ways." Although people know that the future is uncertain, they seem to think they can predict it better than they can. Griffin and Ross (1991) reviewed substantial evidence that people do not appreciate how much their views of the future (and the present) are construals rather than representations of objective reality. Thus, by failing to appreciate the fact that a future event may not occur in precisely the way they imagine, people are prone to errors in their forecasts about how they will feel.

Most research in this area has been concerned with the way in which misconstruals lead to errors in prediction about how people will behave. Social psychologists, for example, have documented many instances in which people underestimate the power of a social situation and thus make incorrect behavioral predictions, such as the failure to appreciate how much people will obey an authority figure in the Milgram (1974) studies or will fail to help a bystander in the Latané and Darley (1970) studies (Ross & Nisbett, 1991). Clearly, if people's misconstruals of how a situation will influence their behavior are off to a large degree (e.g., they assume they will help a person in need but in fact do not), their predictions about how they will feel in these situations will be inaccurate. Few of these studies, however, asked people directly to make affective forecasts.

As noted earlier an exception is a study by Woodzicka and LaFrance (2001), who asked women to predict how they would react if they were asked sexually harassing questions during a job interview and compared these predictions to the actual reactions of women who really were asked the sexually harassing questions during an interview. The forecasters' predictions were surprisingly at odds with the experiences of the women who participated in the real interview, in part because they imagined a different situation than the one faced by the experiencers. The forecasters imagined a situation in which it would be easy to confront the interviewer and where their primary emotional reaction would be anger. In the real interview the women were suddenly faced by a confusing and surprising interaction in which their primary emotional reaction was fear. Sixty-eight percent of forecasters said they would refuse to answer at least one of the three questions, whereas every experiencer answered every question. Twenty-eight percent of the forecasters said that they would confront the interviewer or leave; none of the experiencers did so. Woodzicka and LaFrance (2001) note that women are often unfairly blamed for failing to confront harassment,

precisely because of this kind of misconstrual error. People imagine a situation in which it is easy to confront a harasser, failing to appreciate that the situation will be a more complex one in which they experience intimidation, confusion, and fear.

### 1. Types of Forecasting Errors Caused by Misconstrual

Misconstruals of future situations produce the greatest latitude of affective forecasting errors, because there is no limit to how far off people's construal of the situation can be. If a prospective mother completely misconstrues what the birth of her child will be like, for example, she could be wrong about the specific emotions she will experience and the valence, intensity, and duration of her emotional reactions. There is no reason to assume that misconstrual leads more to overprediction than underprediction of the intensity of affective reactions. If an expectant mother imagines a serene, peaceful birth but has a painful Cesarean section, she will have overestimated how positive she will feel. However, she could just as easily have imagined a painful Cesarean section and experienced a serene, peaceful birth, thereby underestimating how positive she will feel. Misconstrual surely leads to many prediction errors, but it does not explain the prevalence of the impact bias.

## B. FRAMING EFFECTS

People's representations of events also depend on the way in which people frame them, such as the particular attributes of the events that happen to capture people's attention (e.g., Kahneman & Tversky, 1979, 1984). People are prone to an *isolation effect*, for example, which Kahneman and Tversky (1979) defined as the case in which people "disregard components that the alternatives share, and focus on the components that distinguish them" (p. 271; see also Hodges, 1997; Houston, Sherman, & Baker, 1991; Tversky, 1972). When making affective forecasts people often think about how they will feel under alternative scenarios, such as how happy they will be if they vacation at the beach versus the mountains, or if they purchase a home on Elm Street versus Main Street. The isolation effect suggests that when comparing alternative future events people focus too much on features that differentiate the alternatives and too little on features they share, even if the shared features will influence their future happiness.

To test this hypothesis, Dunn, Wilson, and Gilbert (in press) asked first-year college students to forecast what their overall level of happiness would

be the following year if they lived in various dormitories ("houses") at their university, soon before they were randomly assigned to one of the houses. Because the task was framed as a comparison between the different houses, people were expected to focus more on ways in which the houses differed (e.g., physical features such as their beauty and location) and less on factors that the houses would have in common, such as the quality of people's social life (e.g., relationship with their roommates, who would move with the students to whichever house they were assigned), even though social relationships have been found to have a big impact on people's subjective well-being (e.g., Diener & Seligman, 2002).

Consistent with this hypothesis, people's forecasts were much more a function of their ratings of physical features than social features, but when contacted a year later, people's happiness was much more a function of social features than physical features. The net effect was a strong impact bias; by focusing too much on a variable that distinguished between the houses but was uncorrelated with their future happiness, people overestimated the effect of house assignment on their eventual well-being. As seen in Table I, for example, people predicted that they would be much less happy if they were assigned to undesirable than desirable houses, but they were wrong; those living in undesirable houses were nearly identical in their overall happiness to those living in desirable houses.

In a second study Dunn et al. (in press) manipulated people's framing of the task by asking some participants to think about factors that were the same about the houses and things that were different, in counterbalanced order. A recency effect was found, whereby people who thought last about what would be the same across houses based their forecasts more on social features (that were constant across houses). Other participants, replicating Study 1, based their forecasts more on physical factors that distinguished between houses. In short, the way in which people frame the

TABLE I  
PREDICTED VERSUS ACTUAL OVERALL HAPPINESS FOR COLLEGE STUDENTS RANDOMLY ASSIGNED TO UNDESIRABLE AND DESIRABLE HOUSES<sup>a</sup>

	Predicted	Actual	Significance of difference
Undesirable houses	3.43 (1.50)	5.37 (1.16)	$t(52) = 10.71, p < .0001$
Desirable houses	5.96 (.85)	5.45 (.92)	$t(55) = 3.04, p < 0.01$

<sup>a</sup>Predicted and actual happiness were rated on seven-point scales with endpoints labeled 1 = unhappy and 7 = happy. Standard deviation are in parentheses. Adapted from Dunn et al. (in press).

forecasting task can influence the features of an event they use to formulate their forecasts.

### 1. *Types of Forecasting Errors Caused by Framing Effects*

Framing effects will produce an impact bias if, as in the Dunn et al. (in press) studies, people focus their attention on features that they think will influence their emotional states but that actually will be of little importance. In principle, framing effects could increase the accuracy of forecasts, if they focused people's attention on factors that really will influence their later happiness. Suppose, for example, that Dunn et al. (in press) had framed the forecasting task differently, asking students to predict how happy they would be in a year if they were living with different groups of roommates in the same house, rather than in different houses with the same group of roommates. The isolation effect would focus their attention on the effect of social relationships with roommates (which would be variable in this task) rather than on the physical features of the house (which would be constant in this task). Because social relationships are important for people's happiness (Diener & Seligman, 2002; Myers, 1999), framing the task in this way would be likely to increase the accuracy of people's affective forecasts.

## C. RECALL AND AFFECTIVE THEORIES

Suppose that people avoid misconstrual and framing effects and bring to mind an accurate representation of the future event. As seen in Fig. 2, the next step in the process is to figure out how one feels about that event (Loewenstein, O'Donoghue, & Rabin, 1999; Robinson & Clore, 2002). If people have experienced the event before, one way they can assess their feelings about it is simply to recall how they felt in the past. When imagining how they feel about colonoscopies, for example, people could try to recall how they felt when they had one 3 years ago, and assume that they will feel this way again.

It is well known, however, that memory for past affective experiences is poor. Robinson and Clore (2002) note that emotional experiences are not stored in memory in a form that can be retrieved directly later. People can remember *that* a colonoscopy was painful, but the pain itself is not stored in memory and then recalled in its original form. If emotional experiences could be retrieved in their original form, there would be no need to go to the trouble to recreate positive experiences such as vacations or roller coaster

rides; we could relive them by recalling and "replaying" our past reactions to these events (Robinson & Clore, 2002).

Instead of replaying past emotions, people often recall the details of an experience and have emotional reactions to these memories (e.g., someone who feels happy when thinking about his or her vacation in Paris). Because people's recall of their past experiences can be biased, however, there is no guarantee that the feelings evoked by their memories are the same as the feelings they originally experienced. Kahneman and his colleagues, for example, found that whereas on-line emotional experience is quite sensitive to time (e.g., whether a colonoscopy lasts for 20 or 30 minutes), retrospective emotion reports are quite insensitive to time. Instead, retrospective reports are heavily influenced by the peak intensity of the experience and the intensity of the emotional experience when it ended (e.g., the highest amount of pain during the colonoscopy and the amount of pain at its conclusion; see Ariely, 1998; Fredrickson & Kahneman, 1993; Kahneman, Fredrickson, Schreiber, & Redelmeier, 1993; Varey & Kahneman, 1992). Thus, to the extent that people predict their future on-line experiences (how they will feel during a colonoscopy or their next vacation in Paris) from their recall of their past experiences, systematic errors are likely to occur.

As time goes by, people's memory for the episodic details of an experience fades and they must rely more on their theories about how the event will make them feel, rather than on the details of the actual experience (Robinson & Clore, 2002). This is also true of events people have never before experienced; they must rely on their affective theories rather than their past experiences (e.g., "A colonoscopy will be horrible"; "My wedding day will be full of joy").

Every culture has rich theories about the causes of emotions and people develop idiosyncratic theories based on their past experiences (Hochschild, 1979; Nisbett & Wilson, 1977; Wilson & Stone, 1985). These theories are part of the semantic and conceptual knowledge that people use when making predictions about and recalling their emotional experiences and can be at variance with people's actual experiences. Wilson, Laser, and Stone (1982), for example, found that people relied on shared and idiosyncratic theories when assessing the predictors of their daily mood, and although some of these theories were correct (e.g., the relationship between the quality of their interpersonal relationships and their moods), others were not (e.g., the relationship between the amount of sleep they had gotten the previous night and their moods). McFarland, Ross, and DeCourville (1989) found that many women held the theory that they were in worse moods when they were menstruating, and recalled being in worse moods during their periods. When asked to rate their mood on a daily basis for several weeks, however,

these women were in no worse a mood when they were menstruating than when they were not.

### 1. *Types of Forecasting Errors Caused by Poor Recall and Inaccurate Theories*

As discussed, people's recall of their emotional experiences is biased in systematic ways; they weight the peaks and endings of their past experiences more than their duration, which will lead to prediction errors (e.g., that a 30 minute colonoscopy will be no worse than a 20 minute one). Incorrect theories can lead to errors in predicting specific emotions as well as their intensity and duration; people might predict that a lack of sleep will produce prolonged grumpiness and irritation, for example, when in fact it does not cause these emotions at all. There is no reason to assume that inaccurate theories are biased in the direction of overprediction. Sometimes people underestimate their emotional reactions because of faulty theories, as in the case of a man who believes that sad movies have little effect on him, only to find tears trickling down his cheek as the hero and heroine say goodbye and the camera fades to black.

## D. CORRECTION FOR UNIQUE INFLUENCES

There is another problem with gauging our affective reaction to an event and deciding how likely we are to have the same reaction in the future. The circumstances under which people make affective forecasts are almost always different from the circumstances under which they will actually experience an event, and people must subtract out several potential sources of bias on their current assessments of their feelings (labeled "correction for unique influences" on the left side of Fig. 2; see Elster & Loewenstein, 1992; Gilbert, Gill, & Wilson, 2002; Loewenstein, Weber, Hsee, & Welch, 2001). As noted by Kahneman and Tversky (1984), "Some factors that affect decisions do not have a comparable impact on the experience of outcomes" (p. 350). Suppose, for example, that a person is suffering from a cold when trying to decide whether to accept an invitation to a party the following month, and her current negative feelings taint her assessment of how she will feel at the party. Loewenstein et al. (1999) have referred to this phenomenon as a *projection bias*, defined as the tendency for people to "underappreciate the effects of changes in their states, and hence falsely project their current preferences . . . onto their future preferences" (p. 1; see also Loewenstein, 1996).

The projection bias is an instance of *mental contamination*, whereby people's judgments, emotions, or behaviors are influenced in unwanted ways

(Wilson & Brekke, 1994). In the present context, people attempt to come up with an unbiased estimate of what their affective state will be in the future, but their assessment is contaminated by unique influences on their current well-known affective state. It is well known that it is difficult to decontaminate one's own biased judgments. In order to do so people would have to be aware that their judgment is biased, be motivated to correct the bias, be aware of the precise direction and magnitude of the bias, and be able to correct their responses accordingly (Gilbert, 2002; Martin & Stapel, 1998; Tversky & Kahneman, 1974; Wegener & Petty, 1997; Wilson & Brekke, 1994; Wilson, Centerbar, & Brekke, 2002). When thinking about how much they will enjoy a party next month, people might not realize that their estimate is biased by the fact that they have a cold, thereby failing to satisfy the first criterion for correction. Even if they recognize that they are biased, people might not know by how much. And, even if they know by how much, they might not have the resources or motivation to correct their judgments sufficiently (Gilbert, 2002).

Several studies have shown, for example, that when people shop for food to be consumed later, they are influenced by their current state of hunger (Gilbert, Gill, & Wilson, 2002; Nisbett & Kanouse, 1969; Read & van Leeuwen, 1998). Shoppers who have not eaten for several hours think, "Surely I will want several bags of corn chips and a couple of cartons of ice cream next week," failing to adjust for the fact that they will often be full during the week and not experiencing the same cravings. Gilbert, Gill, and Wilson (2002) found that this failure to adjust was exacerbated when people were under cognitive load. Hungry or not hungry participants predicted how much they would enjoy eating spaghetti with meat sauce either the next morning or the next evening. People seem to have considered how appetizing spaghetti sounded to them right then ("Mm, spaghetti!") and then adjusted for the time they would eat it the following day ("But it wouldn't be all that great for breakfast"). When they were not under cognitive load people adjusted to some extent but were still influenced by their current hunger; hungry participants predicted that they would enjoy the spaghetti more the next morning than nonhungry participants did. When they were under cognitive load people found it even more difficult to adjust; hungry participants said that they would enjoy spaghetti in the morning a great deal, as much as they would enjoy it in the evening.

### 1. *Types of Forecasting Errors Caused by Inadequate Correction for Unique Influences*

Inadequate correction can lead to a number of different kinds of forecasting errors, depending on the direction and strength of the influence

and the degree to which people correct for it. If people have a cold when thinking about next month's party, and do not correct for this fact, they might be wrong about the valence of their reaction ("I'll have a terrible time"), or at least the intensity and duration of their affect ("It will be OK but I'll won't want to stay very long"). If people are in an extreme positive state when making the prediction, however, they might make forecasting errors in the opposite direction, overestimating how enjoyable the party will be. There is no reason to assume that inadequate correction is a major source of the impact bias.

### E. EXPECTATION EFFECTS

Expectation effects occur when people's affective forecasts change their actual emotional experience. People who watch a movie with the expectation that it will be one of the best they have ever seen might have a different experience than people who see the same movie with no expectations. Assimilation occurs when people who expect to like the movie enjoy it more; contrast occurs when people who expect to like the movie enjoy it less, if it turns out not to live up to their expectations.

Wilson and Klaaren (1994) reviewed the conditions under which assimilation and contrast are likely to occur in the realm of affective expectations. Assimilation is observed when people's expectations are not too discrepant from the experience (e.g., the movie is not quite as good as people expected) and people rapidly assimilate the experience to their expectations. Wilson, Lisle, Kraft, and Wetzel (1989), for example, showed participants a series of six cartoons, the first three of which were relatively funny and the last three of which were not. When people looked at the cartoons with no expectations about how funny they would be they noticed the discrepancy and rated the first three as significantly funnier than the last three. When people were told that previous participants had found all six cartoons to be very funny they showed clear evidence of assimilation. They found the last three cartoons to be as funny as the first three, and significantly funnier than did people with no expectations. This was true not only of their self-reported ratings of the cartoons, which might have been susceptible to demand characteristics. People's facial expressions were videotaped without their prior knowledge, and those who expected the cartoons to be funny showed significantly more facial mirth while watching the final three cartoons than did people in the no expectations condition.

People with no expectations spent more time looking at the last three cartoons than the first three, apparently because they noticed the change in how funny they were. People who expected the cartoons to be funny looked

at the first and last three cartoons for about the same amount of time, apparently because they did not notice the change in funniness. Armed with the expectation that the last three cartoons would be funny, these people looked at them for significantly less time and found them to be significantly funnier, compared to people with no expectations (see also Kirsch, 1995; Klaaren, Hodges, & Wilson, 1994).

Research on affective expectations has rarely found evidence of contrast effects, whereby people evaluate a stimulus in a direction away from the expectations, after having those expectations disconfirmed. An exception is a study by Geers and Lassiter (1999) in which people were given the expectation that a film would be funny when in fact it was not. In addition, participants were instructed to segment the film into units, by pressing a button whenever a meaningful action occurred (Newtson, 1973). In the gross unitization condition people were instructed to segment the film into the "largest actions that are meaningful to you," whereas in the fine unitization condition people were instructed to segment the film into the "smallest actions that are meaningful to you" (Geers & Lassiter, 1999, p. 404). When people segmented the film into gross units, those who expected it to be funny rated it as funnier than those who did not, replicating the Wilson et al. (1989) study. When people segmented the film into fine units they were more likely to notice that it was not as funny as they expected, resulting in contrast: People who expected the film to be funny rated it as *less* funny than those who did not.

#### 1. Types of Forecasting Errors Caused by Expectation Effects

Affective expectations can increase the accuracy of forecasts to the extent that assimilation occurs. If people expect to like a movie, and that expectation causes them to like it more, their expectation will be confirmed—not because the movie was objectively enjoyable but because of a self-fulfilling prophecy. Such an effect is similar to Sherman's (1980) demonstration of self-erasing prediction errors, whereby the act of predicting how they would behave in the future increased the likelihood that people would behave in that manner.

Affective expectations will reduce the accuracy of a forecast if they lead to contrast effects, whereby people recognize a discrepancy and contrast the experience to the expectation (as in the Geers & Lassiter, 1999 study). For example, people who expect to like a film but recognize that it is disappointingly dull will like it less than people who had no expectations. It should be noted, however, that studies on affective expectations differ in important ways from most studies of affective forecasting, chiefly in the extent to which people's expectations are accessible at the time of the

affective experience. Many forecasting studies use between-subjects designs, whereby some people predict how they will feel in a specific situation and these predictions are compared to the actual reactions of experiencers who were never asked to make forecasts. Studies on the effects of affective expectations, in contrast, deliberately make people's affective expectations salient at the time they experience the stimulus. In the Wilson et al. (1989) and Geers and Lassiter (1999) studies, for example, people were given information about how much other people liked cartoons or a film right before seeing the cartoons or the film.

The kinds of assimilation and contrast effects found in the literature on affective expectations (e.g., Wilson & Klaaren, 1992) are probably more likely to occur when people's expectations are highly accessible at the time of the actual experience. Such effects are less likely to occur when people have never explicitly made an affective forecast, as is in studies of affective forecasting that use between-subjects designs, or when people have made forecasts at a time far removed from the actual experience (e.g., Wilson et al., 2000).

This prediction is consistent with our informal observation that when within-subject designs are used to study the accuracy of affective forecasts, and people's forecasts are measured right before they experience the emotional event, their forecasts can contaminate their actual experience. It is not always clear whether this contamination is due to demand characteristics, whereby people feel compelled to report an emotional reaction that is consistent with how they just predicted they would feel, or a genuine affective expectation effect, whereby people assimilate or contrast an experience to their expectation. In any case, it is clear that many of the errors in affective forecasts documented in the literature are unlikely to be due to expectation effects, because these studies often use between-participants designs in which people's expectations about how they would feel are not highly accessible at the time of the actual emotional experience.

#### F. UNIQUE INFLUENCES ON ACTUAL EMOTIONAL EXPERIENCE I: HOT/COLD INTRAPERSONAL EMPATHY GAPS

Just as there are unique influences on people's assessments of their emotional reactions to an event when making an affective forecast, so are there unique influences on their actual emotional experiences—unique in the sense that they influence people's emotions but not their forecasts, leading to discrepancies between the two. Earlier, we saw cases in which people failed to recognize influences on their emotional or motivational states at

the time of the forecast (e.g., anger, hunger) that would not be in force in the future. There are also cases in which people fail to anticipate influences on their emotional or motivational states in the future that are not impinging on them when they make their forecasts. Just as people who shop when hungry purchase too many junk foods, people who shop when they are full may purchase too few, underestimating how much they will want a bag of corn chips when watching television late the next night.

In Loewenstein, Prelec, and Shatto's (1998) terms, people in temporary "hot" emotional states have difficulty anticipating what they will want later, when in a "colder" state, and people in "cold" emotional states have difficulty anticipating what they will want later when in a "hot" state. In a clever demonstration of the latter phenomenon, visitors to a museum were given an 11-item trivia quiz and asked to choose as compensation a candy bar or the answers to the questions. Most participants who made their choice before taking the test, when they were in a relatively "cold" state (i.e., their curiosity about the answers to the questions was not yet piqued), chose the candy bar (79%). Most participants who made their choice after taking the test, when they were in a relatively "hot" state (i.e., their curiosity was piqued), preferred the answers (only 40% chose the candy bar). A third group of participants was asked, before taking the test, to predict which compensation they would want after taking it. Consistent with the idea that people in "cold" states have difficulty imagining what they will prefer in "hot" states, 62% said they would prefer the candy bar (see also Loewenstein & Adler, 1995).

Loewenstein (1996, 2001) notes that the failure for people in "cold" states to anticipate what it will be like to be in a "hot" state explains a wide array of important phenomena, including drug addiction (e.g., addicts' underestimation of the cravings they will experience when drug deprived), pain management (e.g., women who decide in advance of child birth not to use anesthesia, only to reverse that decision while giving birth), and risky sexual behavior (e.g., people at risk for AIDS who assume in advance that they will use condoms, failing to take into account the "heat of the moment," especially when they are intoxicated; MacDonald, MacDonald, Zanna, & Fong, 2000). People who understood better how they are likely to feel and behave when in "hot" states would be in a better position to anticipate and prevent risky behaviors.

##### *1. Types of Forecasting Errors Caused by Hot/cold Intrapersonal Empathy Gaps*

Hot/cold empathy gaps can lead to either an underprediction or overprediction of the intensity of affective states, depending on the direction

of the gap. If people in hot states are predicting how they will feel in cold states, they will overestimate intensity (e.g., people who are hungry overestimate how hungry they will be the next day). If people in cold states are predicting how they will feel in hot states, they will underestimate intensity, as in the Loewenstein et al. (1998) studies just reviewed.

### G. UNIQUE INFLUENCES ON ACTUAL EMOTIONAL EXPERIENCE II: FOCALISM

In addition to failing to anticipate unique influences on their emotional reactions to an event, people often fail to anticipate the extent to which unrelated events will influence their thoughts and emotions, a tendency that Wilson et al. (2000) termed *focalism* (Schkade & Kahneman, 1998, independently used the term *focusing illusion*). As noted by Wladyslaw Tatarkiewicz (1962/1976), "The pleasures and pains, joys and sufferings, which people actually experience, often fall short of what they had anticipated.... In anticipating a coming event we have it alone in mind, and make no provision for other occurrences" (p. 111). When considering how their emotional lives will be influenced by a future occurrence, such as the outcome of an election or sporting event, people tend to think of their lives in a vacuum, focusing on that occurrence alone ("I'll be thrilled for days if Finkleberry wins the election"). Events do not occur in a vacuum of course, but in the rich context of many other events in people's lives. By neglecting to consider how much these other events will capture their attention and influence their emotions, people overestimate the impact of the focal event.

Wilson et al. (2000) demonstrated focalism and a corrective for it. In one study college football fans predicted, 2 months before an upcoming football game, how happy they would be if their team won. They predicted what their overall level of happiness would be immediately after the game and on each of the succeeding 3 days. The day after the game (which their team did, in fact, win), participants rated their overall happiness. As seen in the control condition in Fig. 3, participants showed a strong impact bias. People predicted that they would be above their baseline level of happiness right after the game and on each of the next 3 days; in fact, their actual level of happiness was no different from their baseline by the day after the game.

Before making their predictions people in a second condition were asked, ostensibly as part of another study, to imagine a specific day in the future—which happened to be the Monday after the upcoming football game. They estimated the number of hours they would spend on 10 everyday activities, such as going to class, socializing with friends, studying, and eating. In

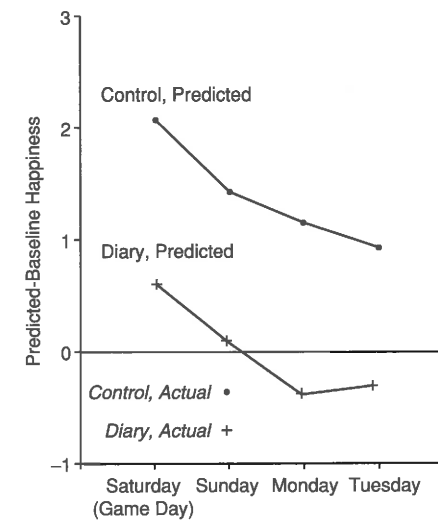


Fig. 3. Predicted versus actual happiness after a victory by one's college football team. Adapted from Wilson et al. (2000).

addition they were given a sheet of paper with 24 blanks corresponding to the hours of that same day, and asked to write in what they thought they would be doing each hour. Wilson et al. hypothesized that when people rated how happy they would be after the football game, the "prospective diary" they had filled out would remind them that the game would not occur in a vacuum, and that their lives would be full of other events that would occupy their thoughts and influence their feelings. Consistent with this prediction, people in the diary condition predicted that the game would impact their happiness significantly less than did people in the control condition (see Fig. 3).

There was evidence that the effects of the diary manipulation on predicted happiness were mediated by how much people believed they would think about the focal events. In the absence of the diary manipulation, people believed that the focal event (e.g., the football game) would dominate their thoughts on subsequent days and thus have a large impact on their happiness. People in the diary condition, who first imagined how full a typical day is with other activities, believed that they would not think about the focal event as much and thus predicted (correctly) that the event would not influence their happiness for very long. Mediation analyses revealed that the effects of the diary manipulation on affective forecasts was mediated at least in part by how much people believed they would think about the focal event in the future.

The focalism hypothesis is relevant to a possible artifactual explanation of the impact bias that concerns the way in which people interpret the forecasting and actual happiness questions. When asked to predict their future happiness, people's attention is drawn to the focal event (e.g., the football game), which might have led them to interpret the question to mean, "How happy I will be in the future when I am thinking about the game?" Later, people are often asked to rate their overall level of happiness without reference to the focal event. Thus, they might have reported something different (their general level of happiness) than they predicted (their happiness when thinking about the game). Perhaps the impact bias is due to the fact that people interpret the forecasting and actual happiness questions to mean different things.

On the one hand, this explanation is not an artifact but the point of the focalism hypothesis: When people make affective forecasts they exaggerate how much the event will be focal in their thoughts and thus overestimate how much it will influence their happiness. On the other hand, the explanation would be an artifact if people know that they will not think about the event very often and know that their overall level of happiness will not be affected for very long, but simply misinterpret the questions they are asked.

There is a considerable amount of evidence, however, that rules out this artifactual explanation, discussed in detail by Wilson et al. (2000). In brief, the impact bias has been found even when people are reminded of the focal event at the time they rate their actual happiness. It has also been found when the people are asked to predict how they will feel 10 minutes in the future and then report how they feel 10 minutes later (e.g., Study 6 by Gilbert et al., 1998, which we will discuss later). Given the short interval of time, it is reasonable to assume that people were thinking about the focal event both at the time they made their predictions and the time at which they rated their actual affect. Finally, Wilson et al. (2000) conducted a study in which people predicted how often they would be in good and bad moods after their favorite team won a football game. If people misinterpret forecasting questions to mean, "how happy will I be when I'm thinking about the event," and people believe that future events will therefore influence them only sporadically, then they might do better at predicting the frequency of their good and bad moods after the event occurs. In fact, people predicted that they would be in good moods significantly more often than they in fact were and that they would be in bad moods significantly less often than they in fact were. The impact bias appears not to be due to an artifact of the way in which prediction questions and actual happiness questions are asked.

### *1. Types of Forecasting Errors Caused by Focalism*

Focalism is the first mechanism we have discussed that produces forecasting errors in only one direction, namely the impact bias, whereby people overestimate the enduring impact of a future event on their emotional reactions. By underestimating the impact of other events on their thoughts and feelings, people by definition overestimate the impact of the focal event. This error can occur in predictions about the initial intensity of an affective experience as well as its duration, to the extent that people neglect to take into account the extent to which other events will moderate intensity and duration (see Fig. 2).

## H. SENSE MAKING PROCESSES

The last (and arguably most important) source of affective forecasting errors involves psychological processes that temper people's emotional reactions. Major life events can surely affect our emotional lives for a very long time. Catastrophic events such as the death of a loved one, divorce, or sexual assault can have enduring effects on our emotions, as can positive events such as finding Mr. or Ms. Right, the birth of a child, or winning huge sums of money. Invariably, however, people's emotional reactions to life events become less intense with time, a phenomenon we have called *emotional evanescence* (Wilson, Gilbert, & Centerbar, in press). As noted by Adam Smith (1759/1853), "The mind of every man, in a longer or shorter time, returns to its natural and usual state of tranquillity. In prosperity, after a certain time, it falls back to that state; in adversity, after a certain time, it rises up to it" (p. 149). A major source of the impact bias, we suggest, is that people fail to anticipate the extent to which they will transform events psychologically in ways that ameliorate their impact.

Although everyone knows that pains and pleasures recede with time, we believe that the reasons for emotional evanescence have been underappreciated by psychologists (in their theories of emotion) and lay people (in their understanding of their own emotional lives). Once people experience an emotional reaction to a life event, what causes the emotion to lessen in intensity? Emotions are not like radioactive isotopes with short half-lives that naturally decay over time. There must be psychological processes that are responsible for the decay of emotional reactions.

Wilson et al. (in press) reviewed previous explanations of emotional evanescence, such as adaptation-level theories. These theories argue that people constantly compare their experiences to similar events in the past, and that their emotional reactions depend on how the current experience

compares to this comparison level (e.g., Brickman & Campbell, 1971; Helson, 1964; Parducci, 1995; Tversky & Kahneman, 1979). When a person travels from Minneapolis to Hawaii in December, for example, a partly cloudy, 70-degree day in Honolulu is likely to cause a good deal of pleasure, because the person is comparing it to the 20-degree, snowy day that was left behind in Minnesota. But over the course of the visit 80-degree sunny days become the standard of comparison, such that a partly cloudy 70-degree day triggers disappointment. As people become used to pleasurable events, they become the standard of comparison and it takes an even more pleasurable event to make them happy. The same principle applies to negative events. A person who travels from Hawaii to Minneapolis might find a 50-degree March day to be intolerable, because it is being compared to a beautiful, Hawaiian, 80-degree, sun-filled days. As time goes by, however, the average weather in Minneapolis becomes the comparison level, such that a 50-degree March day seems quite lovely (Schkade & Kahneman, 1998).

Changes in adaptation level might explain why emotional reactions to external events are short lived. Like sunny Hawaiian days to a Minnesotan, novel events change people's comparison level, dampening their reactions to similar events in the future. One problem with adaptation level theories, however, is that they do not specify the comparison point that people will use at any given point in time. How do people categorize an event in a way that defines the appropriate comparison level? When visiting Hawaii, do people compare the weather to the previous day in Minneapolis, to a running average of the weather they experienced the past two weeks, or to their vacation in Hawaii last year? People have to categorize the event (e.g., "weather in Hawaii," "weather during the past 2 weeks"), and then decide which events in that category are the most appropriate standard of comparison (e.g., the average weather they have experienced during all Hawaiian vacations, the best day they ever had in Hawaii, the worst day they ever had in Hawaii). The process by which people compare new experiences to old ones is undoubtedly complex, determined by such things as the accessibility in memory of previous experiences and the similarity of the present complex to previous ones (see Eiser, 1990, and Frederick & Loewenstein, 1999, for a discussion of these issues).

Further, adaptation level theories cannot explain why people's reactions to a single, newly experienced event taper off, because they focus on people's reactions over time to repeated events. For example, the theories can explain why doing well in college courses will change students' adaptation level, such that they enjoy their tenth "A" less than the first. The theories cannot explain why people's enjoyment of the first "A" wears off relatively quickly, because the comparison level remains the same for that experience.

### *1. The Emotional Implications of Human Sense Making*

Our basic argument is that people make sense of their worlds in a way that speeds recovery from emotional events, and that this sense-making process is largely automatic and nonconscious. Humans inexorably explain and understand events that were initially surprising and unpredictable, and this process lowers the intensity of emotional reactions to the events. Humans beings are adept at orienting to important, novel events in their environment and then transforming these events psychologically in order to understand them better. As noted by Roese and Olson (1996), "People perceive the occurrence of an outcome and are compelled to make sense of it" (p. 297). Although such sense-making processes are well known, we believe their ramifications for people's emotional experiences have not been fully appreciated.

Sense-making processes and emotional evanescence can be broken down into four basic steps. First, people orient to unexpected but relevant information in their environment. Such an orienting response has been found in many species (e.g., Anderson, 1994; Cheal, Johnson, Ellingboe, & Skupny, 1984; Hilgetag, Lomber, & Payne, 2001; Vinogradova, 2001; Wechsler, 1992) and in human infants in the first few months of life (e.g., Quinn, Eimas, & Tarr, 2001; Fantz, 1964). It has been found on a wide variety of cognitive tasks and with various measures of brain activity (e.g., Donchin, 1981; Enns, Austen, Di Lollo, Rauschenberger, & Yantis, 2001; Johnston & Schwarting, 1997; Hamann, Ely, Hoffman, & Kilts, 2002; Daffner et al., 2000; Kimmel, Van Olst, & Orlebeke, 1979; Spencer, Dien, & Donchin, 2001). It is not novelty per se that attracts human attention and information processing. If it were, people could not walk down the street without stopping every second to examine parts of their visual fields that they had never seen before, such as the face of every stranger, novel patterns of clouds, and the fact that a gopher burrowed a hole in a new part of the adjacent park. Instead, people engage in selective attention, in which they screen out information that is irrelevant to their processing goals, unless that information is so "newsworthy" (i.e., important to some other goal) that it suddenly attracts attention. The park groundskeeper would be much more likely to notice the new gopher hole, even if he or she had been thinking about which trees needed pruning.

Second, people have more intense emotional reactions to unexpected, relevant information than to other events. The groundskeeper will react more strongly, for example, to a gopher hole that is unexpected and suddenly pops into attention than to one that was there yesterday. The more discrepant new information is from people's existing knowledge structures, the more intense their emotional reactions to it. Sometimes events occur that

are not relevant to our current goals or focus of attention; they appear out of the blue. In Ortony, Clore, and Collins' (1988) terms, these events are characterized by "unexpectedness," and "unexpectedness is positively correlated with the intensity of emotion" (Ortony et al., 1988, p. 64). Other times an event is not completely unexpected but is of low perceived probability; Ortony et al. (1988) refer to such occurrences as violations of perceived likelihood. Surprising occurrences such as these also produce intense emotional reactions. Mellers and McGraw (2001), for example, found that people who won \$8 on a gambling task were happier when the odds of winning were 20% than when the odds were 80%. Similarly, people who lost \$8 were unhappier when the odds of losing were 20% versus 80% (see also Coughlan & Connolly, 2001).

Third, once an unexpected event occurs and people have a relatively intense emotional reaction, they attempt to make sense of the event, quickly and automatically. Unlike almost all other species, humans possess the ability to perform sophisticated cognitive operations on their representation of the stimulus; indeed, Mandler (1975) equates attention with an analysis of the meaning of a stimulus or event; the two are indistinguishable: "Any input to the cognitive-interpretive system is subjected to an analysis of its relation to existing structures" (p. 26). As Gilovich (1991) noted, "We are predisposed to see order, pattern, and meaning in the world, and we find randomness, chaos, and meaninglessness unsatisfying. Human nature abhors a lack of predictability and the absence of meaning" (p. 9).

The way in which humans transform the world into a predictable place is well documented. Piaget (1952; Piaget & Inhelder, 1969) discussed how children assimilate new events to existing knowledge structures, or, if that is not possible, alter their knowledge structures to accommodate the new information. People are also skilled explainers of their social worlds, making quick attributions about the causes of their own and other people's behavior (Gilbert, 1991; Heider, 1958; Jones & Davis, 1965; Kelley, 1967). As Heider (1958) noted, a person makes causal attributions "not only because of intellectual curiosity, but also because such attribution allows him to understand his world, to predict and control events involving himself and others" (p. 146). Holyoak and Simon found that when making decisions, such as about a legal case, people inexorably show coherence shifts, whereby complex, contradictory, information is transformed into an internally consistent, coherent viewpoint (Holyoak & Simon, 1999; Simon, Pham, Le, & Holyoak, 2001). If people feel that they cannot control, predict, or understand their environments, they are at risk for severe motivational and cognitive deficits, such as depression (Abramson, Seligman, & Teasdale, 1978; Langer & Rodin, 1976; Pittman, 1998; Schulz, 1976; Seligman, 1975; Taylor & Brown, 1988; Thompson, Armstrong, & Thomas, 1998).

Fourth, when people make sense of an event it no longer seems surprising or unexpected, and as a result they think about it less and it produces a less intense emotional reaction. The process of sense making "ordinizes" events in a way that robs them of their emotional power (Wilson et al., *in press*).

Emotional evanescence may also be adaptive in and of itself, independent of the human proclivity to make sense of the environment (Wilson et al., *in press*). A number of theorists have argued that a basic function of an emotion is to signal people about dangers and opportunities in their environments (e.g., Damasio, 1994; LeDoux, 1996). Rather than having to stop and analyze every situation consciously and deliberately, people have quick emotional reactions that tell them whether to approach or avoid a stimulus.

To serve this signaling function, it is important that emotional reactions to previous events not last too long; for emotional signals to get through, people's systems must not be swamped by responses to past events. If we are still euphoric or depressed over something that happened yesterday, we will be less sensitive to new dangers or opportunities that are occurring today. One reason for this is that intense emotional reactions interfere with higher order cognitive processing, making it difficult to think clearly. Although moderately positive states enhance creative problem solving (Fredrickson, 1998; Isen, 1993), extreme states—in either a positive or negative direction—are likely to reduce attention and impede processing (Easterbrook, 1959).

Another reason that it is to people's advantage to recover quickly from emotional reactions is the conservation of energy. To the extent that emotions are accompanied by physiological arousal, our bodies can maintain high levels of arousal for only so long. Imagine, for example, how it feels to experience a great surge of joy and excitement, such as the day you were married, the day your child was born, or when you learned that you had won a coveted prize. Now imagine that you felt that way for a week. As wonderful as such experiences are, it would be exhausting to maintain them for very long. It would be dangerous, or even fatal, for our heart rate and blood pressure to remain elevated for a prolonged period of time. To protect our health, there must be mechanisms that counteract perturbations to our emotional system.

Wilson et al. (*in press*) and Wilson (2002) discussed different mechanisms that foster emotional evanescence, such as those posited by opponent process theory (Solomon, 1980). Perhaps the most powerful way, we suggest, is by invoking the kinds of sense-making processes we have already discussed. The human sense maker may have evolved in part because it serves the important, adaptive function of emotional evanescence.

Sense making can take several forms, with the common feature that it reduces discrepancies between people's schemas and unexpected, relevant

events. As mentioned it can involve assimilation, accommodation, and causal attribution. Another example is the hindsight bias, whereby people transform an event psychologically after it occurs to make it seem more predictable than it really was. Historical upheavals, improbable outcomes of sporting events, and sudden break ups of relationships all seem like things that we should have anticipated, in retrospect (Carli, 1999; Fischhoff, 1975; Hawkins & Hastie, 1990; Roese & Olson, 1996; Wasserman, Lempert, & Hastie, 1991).

Although the hindsight bias is well-known, its consequences for emotional evanescence have been not been examined systematically. As we have seen, events that are unexpected have more emotional impact than ones that are easy to explain and understand. Explaining events in a way that make them seem predictable, then, should lower the intensity of people's emotional reactions to them. Further, this process occurs automatically and nonconsciously (e.g., Pohl & Hell, 1996). Indeed, if people were fully aware of their post hoc sense making, they would not commit the hindsight bias. In fact, most sense-making processes, such as causal attributions, whereby people strive to understand and explain each others' behavior, require little or no mental effort, are unintentional, and occur outside of awareness (Gilbert, 1998; Gilbert, Pelham, & Krull, 1988). This fact is crucial to our understanding of forecasting errors.

## 2. Failures to Anticipate Sense-Making Processes: Ordinization Neglect in Reaction to Positive Events

A major source of the impact bias, we suggest, is people's failure to anticipate how much they will transform events psychologically in ways that reduce their emotional power. In other words, people do not appreciate the extent to which they will "ordinize" an event by engaging in the kinds of sense-making processes we have discussed, leading to *ordinization neglect*. "I will be thrilled if I receive tenure," an assistant professor thinks, "and I'll be happy for years to come." When assistant professors first learn that their tenure has been approved they probably are thrilled, particularly if their case was not a sure thing. Inevitably they begin to make sense of their achievement, however, as they assimilate it into their knowledge structures or create new schemas. They find themselves thinking less and less about their tenure as time goes by, and sooner rather than later, it recedes into the background of their busy lives. The knowledge that "I am an associate professor with tenure" becomes ordinary knowledge with little "zing" to it. Consequently, the tenure decision does not lead to the lasting happiness that people anticipated. As noted by Nathaniel Hawthorne in his short story *Rappaccini's Daughter*, "How often is it the case, that, when impossibilities

have come to pass, and dreams have condensed their misty substance into tangible realities, we find ourselves calm...amid circumstances which it would have been a delirium of joy to anticipate!" (1846/1937, p. 1055).

Consistent with this reasoning, Gilbert et al. (1998) found that a positive tenure decision did not cause the lasting happiness that untenured professors anticipated. Assistant professors at a large university predicted what their general level of happiness would be in the 5 years after receiving tenure, and these forecasts were compared to the actual level of happiness of professors who had been granted tenure at that university in the previous 5 years. The assistant professors predicted that they would be significantly happier than were the professors who had successfully achieved tenure, suggesting that they were overestimating the impact that a positive decision would have.

Other studies have examined more directly whether impact biases to positive events are due to ordinization neglect. The strategy in these studies was to manipulate the ease with which people could ordinize a positive emotional event by making sense of it, with the prediction that people's emotional reactions would last the longest in the conditions in which sense making was most difficult. People who forecasted their emotional reactions were expected to be insensitive to this manipulation of sense making. That is, they were expected to fail to realize that their emotional reactions would fade the quickest in the conditions in which sense making was the easiest, due to ordinization neglect.

Centerbar, Wilson, and Gilbert (2002), for example, gave students positive social feedback, thereby improving their mood, and then manipulated how easily the students could make sense of the feedback. When a student arrived the experimenter took his or her picture, scanned it into a computer, and entered it into an instant messaging program to be sent to five students at other universities, ostensibly as part of a study of impression formation over the internet. The participant then saw the pictures of the other students appear on the screen and exchanged information with these students about their values, interests, and backgrounds. There was in fact only one real participant in each session; the information about the other five (two of the same gender as the participant, three of the opposite gender) was preprogrammed into the computer.

After people exchanged information, they asked the students to choose the one opposite sex member of the group who they thought would make their "best potential friend" and to write a paragraph explaining why. Participants were told that their choice and explanations would be sent to the other group members, and that they would learn who the opposite sex group members chose and read their explanations. After

sending their choice and explanation, participants waited while the other students' choices and explanations appeared on the screen one at a time, ostensibly as they were sent by the students.

In the experiencer conditions participants learned that all three of the opposite sex students chose them as their best potential friend. The paragraphs explaining the reasons for these choices were uniformly positive, though distinct in their details. To manipulate how easily people could make sense of this positive feedback, experiencers were randomly assigned to one of two conditions. In the revealed condition people were told which of the other students had written each paragraph explaining their choice. When a paragraph appeared on the screen, the picture and name of the author of that paragraph was displayed next to it. In the anonymous condition participants were told that in order to maintain confidentiality, the authors of each paragraph would not be shown. These participants received the same positive feedback (that all three opposite sex students had chosen them) and read the same paragraphs explaining why; the only difference was that they did not know which of the students had written which paragraph.

Participants completed mood scales immediately after receiving the feedback, completed a filler task of word search puzzles for 15 minutes, and then completed the mood scales again. Centerbar et al. (2002) predicted that participants in both the revealed and anonymous condition would be very happy right after receiving the positive feedback; the surprisingly positive news should produce a highly favorable response. Over the next several minutes, however, people in the revealed condition should find it easier to make sense of the feedback, given that they knew who said what ("It is no surprise that Sarah liked my values; I remember that she answered the questions similarly to me"). The specific student that was said to author each paragraph was counterbalanced, but regardless of who said what, participants could probably find reasons why. As a consequence of this sense making, the positive reactions of people in the revealed condition were expected to fade over time, demonstrating emotional evanescence. People in the anonymous condition could not as easily make sense of why each person wrote what they did, given that the authorship of the paragraphs was unknown. Consequently their positive reactions were expected to fade more slowly, showing less emotional evanescence.

Participants in a control condition took part in the study up to the point at which they expected to receive the feedback about who the other students chose as their best potential friend, at which point they rated their mood. Forecasters also participated up to the point at which they expected to receive the feedback from the other students. These students were then asked to imagine that they had been chosen by everyone as their best

potential friend and to read the paragraphs explaining why (these paragraphs were identical to the ones experiencers received). They predicted what their mood would be right away and 15 minutes later, if they knew who had authored each paragraph and if they did not. Finally, choosers were given the actual feedback and paragraphs to read and were allowed to choose whether they wanted to know which person had authored each paragraph. The computer program said that some previous participants had preferred to know and others had not, and instructed the participant to click on one button if they wanted to learn the author of each paragraph and another if they did not.

As predicted, experiencers in both the revealed and anonymous conditions were significantly happier than control participants, right after learning that they had been chosen as everyone's best potential friend, but did not differ from each other (see means in Table II). That is, the feedback made people in the revealed and anonymous conditions equally happy at first. As predicted, however, experiencers' positive mood decreased more rapidly in the revealed than the anonymous condition. The drop in positive mood in the revealed condition was significantly larger than the drop in the anonymous condition.

Table II also shows forecasters' predictions about what their mood would be in the different conditions. People were generally accurate about how happy they would be in the revealed condition; their predicted happiness at Times 1 and 2 correspond closely to the experiencers' moods at these points in time. People were inaccurate about how happy they would be in the anonymous condition. In fact, their predicted mood was lower than people's predicted mood in the revealed condition, especially at Time 2, which was the opposite of what was found for experiencers. People's theory seems to have been that not knowing who authored which paragraph would spoil their mood when in fact it enhanced it (at Time 2). Consistent with this

TABLE II  
MEAN POSITIVE AFFECT IN INTERNET IMPRESSION FORMATION STUDY<sup>a</sup>

Time	Control	Experiencers		Forecasters	
		Revealed	Anonymous	Revealed	Anonymous
Time 1	6.73 (.74)	7.76 (.86)	7.98 (.79)	7.63 (1.12)	7.29 (1.00)
Time 2		6.39 (1.29)	7.06 (1.44)	6.56 (1.13)	5.91 (.99)

<sup>a</sup>Means are the average of several mood scales rated on nine-point scales, with higher numbers reflecting a more positive mood. Standard deviations are in parentheses. From Centerbar, Wilson, and Gilbert (2002).

interpretation, 100% of the people allowed to choose whether to find out who authored which paragraph elected to do so; that is, they placed themselves in the condition that forecasters believed would make them happy the longest, but which in fact made experiencers less happy.

Our preferred explanation of these results is that experiencers in the revealed condition were better able to make sense of ("ordinize") the positive feedback they received, and by so doing reduced its emotional impact. The feedback stayed alive longer in the anonymous condition precisely because participants could not as easily make sense of it and stop thinking about it. An alternative explanation is that at least some people in the revealed condition were disappointed by knowing who had authored which paragraph, to the extent that they liked one person more than the others, preferred one of the paragraphs to the others, and were disappointed that their favorite person did not give them their favorite feedback. To avoid this possibility we carefully pretested the descriptions of the three opposite sex students and the paragraphs, such that most people did not strongly prefer one of the students or paragraphs. Further, when asked to rate how pleased they were with the feedback they received from the three students, people in the revealed condition were just as pleased overall as people in the anonymous condition. Contrary to the disappointment hypothesis, people in the revealed condition were significantly more pleased with the feedback they received from their favorite person (the one they had selected as their best potential friend) than were people in the anonymous condition.

Nonetheless, it is possible that the revealed and anonymous conditions differed in some way other than the ease of making sense of the feedback. Wilson, Kermer, and Gilbert (2002) performed another study that attempted to make a positive event as similar as possible except that it was easier to explain under some conditions. Students who were studying alone in a university library were approached by a research assistant who handed them a card with a dollar coin attached to it (a United States Sacagawea dollar), said "Hi, this is for you, have a nice day," and walked away.

There was written information on the cards that varied slightly across conditions. In the uncertain condition three facts were listed, namely "The Smile Society," "A Student/Community Secular Alliance," and "We Like to Promote Random Acts of Kindness." These facts were expected to be somewhat puzzling and difficult to make sense of. In the certain condition the information on the cards was identical, except that two question were added to which the facts provided an answer. At the top of the card, in a different color ink, was the question, "Who Are We?" followed by "The Smile Society" and "A Student/Community Secular Alliance." Following this, also in a different colored ink, was the question, "Why are We Doing

TABLE III  
MEAN POSITIVE AFFECT IN LIBRARY COIN STUDY<sup>a</sup>

Control	Experiencers		Forecasters	
	certain	uncertain	certain	uncertain
5.1 (1.7)	4.9 (0.9)	6.7 (1.2)	7.3 (0.9)	6.8 (0.9)

<sup>a</sup>Means are the average of mood ratings on 9-point scales; higher numbers indicate more positive moods. Standard deviations are in parentheses. From Wilson, Kermer, and Gilbert (2002).

This?" followed by "We Like to Promote Random Acts of Kindness." Thus, the information (the answers) was the same in both conditions, but the question-and-answer format in the certain question was expected to be easier to make sense of. Rather than puzzling over what the information meant, people might view it as answers to reasonable-sounding questions, and thereby find it easier to continue with what they were doing.

To see if people in the two conditions had different affective reactions to the cards, a different research assistant approached people 5 minutes later and asked if they would complete a brief survey for their psychology class. The survey contained a few filler questions about their study habits followed by standard mood scales. We also included a control condition in which people received the survey without having first been approached and given a dollar coin.

As seen in Table III, the results were largely as predicted. Five minutes after receiving the coin, participants in the certain condition were no happier than control participants who had not been given a dollar. We assume that they were happy to receive the dollar at first but that this happiness had faded over the next 5 minutes (though of course we do not know for sure what their immediate affective reaction was because we were unable to measure it). As predicted, people in the uncertain condition were in a significantly better mood at the 5 minute point than people in either the control or certain condition.

Table III also shows the predictions made by forecasters who were approached in the library, asked to imagine that they were given one of the cards with the dollar on it, and predict what their mood would be 5 minutes later. Forecasters in the uncertain condition made quite accurate predictions about how happy they would be. Forecasters made inaccurate predictions in the certain condition, however (the one with the question-and-answer format on the card). They predicted that they would be in a better mood than did forecasters in the uncertain condition, when in fact experiencers in this condition were in a significantly less positive mood. Like the

forecasters in the Centerbar et al. (2002) internet impression formation study, people seem to base their forecasts on the theory that certainty (in this case, the ease of making sense of the questions and answers) would be more pleasing and mood enhancing, when in fact it was less pleasing and mood enhancing.

### 3. Types of Forecasting Errors Caused by Ordinization Neglect

Like the focalism bias, ordinization neglect produces errors in one direction only. Because people underestimate the speed with which they make sense of novel events they overestimate the duration of their emotional reactions, leading to the impact bias.

## I. THE PSYCHOLOGICAL IMMUNE SYSTEM: MAKING SENSE OF NEGATIVE EVENTS

So far, we have explored ordinization neglect in response to positive events, such as receiving positive social feedback or an unexpected monetary gift. Does ordinization neglect occur when people predict how they will respond to negative events?

People possess powerful psychological defenses that serve to ameliorate the impact of negative information. These defenses are so pervasive and effective that they can be thought of as a psychological immune system that detects and neutralizes events that challenge people's sense of well-being (Gilbert et al., 1998). Social and clinical psychology have documented many such psychological defenses, including psychoanalytic defense mechanisms, dissonance reduction, self-affirmation, motivated reasoning, self-deception, positive illusions, and terror management (e.g., Aronson, 1968; Dunning, 1999; Festinger, 1977; Folkman, 1984; S. Freud, 1924/1968; A. Freud, 1966; Greenwald, 1980; Kunda, 1990; Pyszczynski, Greenberg, & Solomon, 1997; Steele, 1988; Taylor, 1989; Tesser, 2000; Vaillant, 2000). There is, of course, a great deal of human suffering in the world, and the psychological immune system can only do so much to ameliorate this suffering. Our psychological pain and suffering would be a lot worse, however, if we did not possess potent psychological defenses that hasten our recovery from them.

The psychological immune system can be thought of as a special case of the kind of human sense making we have already discussed. When any novel important event occurs, cognitive processes are triggered to make sense of it. If that event is negative and challenges people's sense of well-being, the psychological immune system turbo charges the sense-making process, giving it extra force and direction. People are motivated to make sense of

any novel event, but are especially motivated to interpret negative events in ways that minimize their impact.

A feature that the psychological immune system shares with other sense-making processes is that it occurs largely outside of awareness. In fact, as noted by Gilbert et al. (1998), psychological defenses are more effective by operating behind the mental scenes. If people recognized the extent to which they transformed events psychologically in order to make themselves feel better, these transformations would not be nearly as compelling. When Bob learns that Sarah has left him, for example, he gradually reduces the pain by emphasizing Sarah's flaws and deciding that she was not right for him after all. His rationalization works best if Bob does not recognize it as such. It is difficult to accomplish such a rationalization deliberately and consciously; it would not be very effective for Bob to say, "As of 2 PM today I will stop loving Sarah by focusing on the fact that she always leaves empty water bottles and gum wrappers on the floor of my car." Rather, his psychological defenses are mobilized automatically and nonconsciously. Sarah begins to appear objectively different to Bob, and he does not realize that it was not she who changed but his construals of her.

### 1. Failures to Anticipate Sense-Making Processes: Immune Neglect in Reaction to Negative Events

A major source of the impact bias in response to negative events is people's failure to anticipate how much their psychological immune systems will hasten their recovery, a phenomenon that Gilbert et al. (1998) termed *immune neglect* (which, as noted above, can be viewed as a special case of ordinization neglect). Before Sarah broke up with him, Bob would likely have predicted that it would take him months, if not years, to recover. He would be underestimating the extent to which a break-up would trigger defensive psychological processes that would speed his recovery. Just as people fail to appreciate the extent to which they will "ordinize" positive events by making sense of them, they fail to appreciate the extent to which they will "defang" negative events by rationalizing, reconstruing, or minimizing them.

Gilbert et al. (1998) found support for this hypothesis in several studies. The logic of these studies was to manipulate the ease with which people could rationalize a negative emotional event, with the prediction that they would recover the quickest in the conditions in which rationalization was easiest. People who forecasted their emotional reactions were expected to be insensitive to this manipulation of rationalization. That is, they were expected to fail to realize that they would recover most quickly from the

TABLE IV  
MEAN HAPPINESS IN JOB INTERVIEW STUDY<sup>a</sup>

Time	Experiencers		Forecasters	
	Unfair ( <i>n</i> = 20)	Fair ( <i>n</i> = 19)	Unfair ( <i>n</i> = 20)	Fair ( <i>n</i> = 19)
Time 1	-.40 (1.19)	-.68 (1.34)	-2.10 (1.68)	-2.11 (1.94)
Time 2	.00 (1.12)	-1.26 (1.97)	-1.90 (2.02)	-2.00 (1.45)

<sup>a</sup>Means are changes from a baseline measure of happiness. Standard deviations are in parentheses. From Gilbert et al. (1998, Study 6).

negative events when rationalization was the easiest, due to immune neglect.

In one study, for example, college students interviewed for a desirable job in which they would be paid to sample consumer products (Gilbert et al., 1998). Participants in the unfair decision condition were interviewed by a lone business student who asked questions that were only marginally related to the job, such as "Why did you pick your major?" Participants in the fair decision condition were interviewed by a panel of three business students who asked highly relevant questions. Further, participants were told that they would fail to get the job only if the three interviewers unanimously voted against them. All participants then predicted how happy they would be immediately and 10 minutes after learning they had and had not received the job. Next, all participants learned that they did not, in fact, get the job, and rated their actual happiness then and 10 minutes later.

Gilbert et al. (1998) hypothesized that people in both conditions would be unhappy when they first learned that they did not get the job but that those in the unfair condition would recover more quickly, by finding it easier to rationalize this negative outcome. That is, people in the unfair condition could rationalize the impact of the decision by blaming it on the capricious interviewer, whereas people in the fair condition could not rationalize the outcome as easily, given the unanimity of the interviewers and the fairness of their questions. Consequently, the negative impact of the event should last longer in the fair decision condition.

This is precisely what happened, as seen in Table IV under "experiencers." Right after learning that they had not received the job people in both the fair and unfair condition were less happy than they had been at the beginning of the study, and did not differ significantly from each other (the cell entries are their happiness ratings minus this baseline measure). After 10 minutes people in the unfair condition were back to their baseline

level of happiness, whereas people in the fair condition had become even more unhappy; the two groups differed significantly at this point in time.

Consistent with the immune neglect hypothesis, people did not anticipate that they would react differently in the fair and unfair conditions. As seen on the right side of Table IV, forecasters predicted that they would be unhappy if they did not get the job to an equal degree in both conditions, and that they would still be unhappy 10 minutes later. These results are consistent with the hypothesis that people in the unfair condition failed to anticipate the ease with which they would rationalize a failure to get the job by blaming the capricious interviewer.

Gilbert et al. (1998) found similar results in several other studies. In one, for example, people predicted that they would be equally unhappy if they received negative personality feedback from two clinical psychologists who had examined their test results or from a computer program that had analyzed their test results. In fact, people who received negative feedback from the computer were not as unhappy as people who received it from the clinicians, presumably because they found it easier to rationalize by questioning the validity of the feedback ("what does a bunch of circuit boards and computer chips know anyway?").

## J. SUMMARY

We documented a number of sources of error on affective forecasts, including misconstruing the nature of the future event, errors in recall of past emotional experiences, faulty affective theories, failures to correct for unique influences on forecasts, and framing. Additional sources of error stem from people's failure to take into account, when making affective forecasts, factors that will influence their later emotions. A failure to anticipate expectation effects can increase or decrease the accuracy of people's forecasts, depending on whether people's expectations lead to assimilation (people change their actual reactions to conform to their forecasts) or contrast (people's expectations lead to an even larger discrepancy between the forecast and the emotional experience). Hot/cold intrapersonal empathy gaps can lead to under- or overprediction, depending on the direction of the gap. People forecasting while in hot states (e.g., grocery shopping while hungry) overestimate how they will feel in the future when in a cold state (e.g., how much they will want to eat corn chips after a large meal later in the week). People forecasting while in cold states (e.g., grocery shopping when full) tend to underestimate how they will feel when in hot states in the future (e.g., how much they will want to eat corn chips while watching television late at night). Although each of these factors can

produce errors in forecasting, none leads systematically to an overestimation of the impact of future events on one's affective reactions.

Focalism and the underestimation of sense-making processes (ordinization neglect and immune neglect) lead uniquely to the impact bias, whereby people overestimate the enduring impact that future events will have on their emotional reactions. Focalism, whereby people fail to anticipate the extent to which unrelated events will influence thoughts and emotions, causes people to overestimate the impact of the focal event, such as the outcome of an upcoming football game.

Perhaps the most pervasive influence on affective forecasting is the failure to anticipate one's own ability to make sense of the world in ways that minimize its emotional impact. We documented ordinization neglect for positive events and immune neglect for negative events, both of which produced the impact bias. The fact that the impact bias is by far the most common error found in affective forecasting research is testimony, perhaps, to the pervasiveness of people's tendency to fail to anticipate their own sense-making processes.

### III. Dynamics of Sense-Making Processes

The failure to appreciate the workings of one's own sense-making processes has several intriguing consequences, including the promotion of beliefs in external agents and several types of failures to maximize one's own happiness.

#### A. THE ILLUSION OF EXTERNAL AGENCY

Things often work out for the best, or so it seems. It might be difficult to decide between a job in Grand Rapids and one in Plattsburgh, and after moving to Grand Rapids, we might worry that we made the wrong choice. After settling in and making a life for ourselves, however, we find that we are quite happy and thank our lucky stars that we made the right decision. In fact, the more we think about it, the more it seems that most of our difficult decisions turned out for the best, as if there were a "guiding hand" shepherding us in the right direction whenever we had tough choices to make.

Although we cannot say definitely whether there is a guiding hand helping people in need, we can say that immune neglect fosters such a belief. In the above example, people may have overlooked the fact that it was their

psychological immune systems that created the belief that their chosen lives were superior to the unchosen ones, as has been demonstrated in many studies of postdecisional dissonance (e.g., Brehm, 1956). Because people are largely unaware that their internal dynamics promote such positive change, they look outward for an explanation.

Gilbert et al. (2000) demonstrated such an illusion of external agency in a study in which participants were told that they would play a "self-disclosure game" with another student. After performing an unrelated visual detection task, participants read four autobiographical statements of other students and either rated how much they would like each one as a partner (the committed group) or did not rate their preferences (the uncommitted group). The autobiographies were then placed in folders and the participants randomly chose one to determine which person would be their partner. Through experimental sleight-of-hand, all participants chose a partner who was not their first choice, after which they rated how much they liked this person.

Gilbert et al. (2000) assumed that it would be easier for uncommitted participants to reduce dissonance by increasing their liking of the chosen partner, because they had not publicly stated earlier that they did not like this person. This was indeed the case; people in the uncommitted condition rated their partner significantly more favorably than people in the committed condition did. How did they explain their lucky choice of such a wonderful partner?

At this point the experimenter said that the study was over and explained that it was actually a test of the effectiveness of subliminal messages. The visual detection task they had completed earlier, participants were told, actually included subliminal primes designed to increase the likelihood that they would pick the folder with the most favorable partner. In fact, there were no subliminal messages in the earlier task. As predicted, though, when asked to rate how effective the subliminal primes had been, people in the uncommitted condition believed that they had been influenced more by the primes than people in the committed condition did. Why? By failing to realize that it was their own psychological immune systems that had created the belief that their choice of partner was optimal, they attributed this "lucky choice" to the influence of subliminal messages that were not, in fact, present.

According to national surveys, most people believe in a divine being. Eighty-one percent of Americans, for example, reported that they had felt God's presence (Gallup & Castelli, 1989). Again, we certainly cannot speak to the accuracy of such beliefs. We can suggest, however, that immune neglect might have contributed to them, just as it contributed to a belief in subliminal influence in the Gilbert et al. (2000) study. Gilbert and Rinsky

(1999), for example, found a correlation between the strength of people's psychological immune system and their belief in God. Participants filled out a survey in return for a bag of one of two brands of chocolate chip cookies; to determine which brand they would get, participants picked a folded slip of paper labeled "Brand A" or "Brand B." They then tasted cookies of each brand and rated how much they liked them. Unbeknownst to participants, the two cookies were identical. The extent to which they said they preferred the brand they had chosen was used as a measure of their propensity to reduce dissonance; that is, the more they exaggerated their liking for their chosen alternative, the more they had engaged in a rationalization process.

Gilbert and Rinsky (1999) hypothesized that people who are most prone to reduce dissonance in this manner might be most susceptible to the illusion of external agency. For example, if they consistently find that their difficult choices turn out for the best, they might misattribute such dissonance reduction to a supreme being. Consistent with this hypothesis, the more people exaggerated their liking for their chosen brand of cookie, the more likely they were to report on a subsequent survey that they believed in God,  $r = .31$ ,  $p < .05$ . This is a correlational finding, of course, and it is not certain whether it was people's propensity to reduce dissonance that caused their belief in a higher power. It is possible, for example, that it was people's belief in God that made them more likely to reduce dissonance. The results are consistent with the Gilbert et al. (2000) laboratory studies, though, that found experimental evidence for a tendency to misattribute one's own ability to "make the best" of a choice to an external agent.

## B. KEEPING ONE'S OPTIONS OPEN—AT AN AFFECTIVE COST

Another consequence of immune neglect is that people might arrange their choices in ways that inadvertently make it difficult for them to reduce dissonance. Imagine that Professor Jones has been offered an attractive job at a university and decides to accept. Her current university offers her the opportunity to take a leave of absence rather than resigning, in case she discovers that she does not like her new position and wants to return. Should she take her university up on this offer and keep her options open?

Why wouldn't people want to give themselves the opportunity to change their minds? What if Professor Jones discovers that she hates living in a small town and pines for the big city life she left behind? People often pay extra for the ability to revoke a decision, such as those who shop for clothes at an expensive boutique with a liberal return policy rather than a discount store in which all sales are final. Indeed, it is often rational to try out

TABLE V  
MEAN CHANGE IN RANK OF RATING OF POSTERS<sup>a</sup>

Experiencers		Forecasters	
Unchangeable	Changeable	Unchangeable	Changeable
.71	-.07	-.44	-.33

<sup>a</sup>Means are changes the rank assigned to the poster participants chose to take home. From Gilbert and Ebert (2002, Study 2a).

something before committing oneself to it. Extended courtships are usually a better idea, for example, than marrying someone after the first date.

If people have experience with the options and know what they entail, however, it might be best to make an irrevocable choice, given that postdecisional dissonance reduction is most likely to occur after a decision is final (e.g., Frey, 1981; Lowe & Steiner, 1968). The cost to keeping one's options open is that it prevents people from making the best of their situation psychologically by reducing postdecisional dissonance. Suppose that Professor Jones discovers that she is expected to do a considerable amount of undergraduate advising at her new institution, which she finds onerous. If she has given up the option of returning to her home institution she will be motivated to reduce her dissonance by deciding, perhaps, that she always wanted to spend more time with undergraduates. If she still has the option of returning home, however, she is more likely to resent the time that the advising takes away from her scholarly activities. Because she can still decide to revoke her decision she needs to keep an accurate tally of the pros and cons of her new job, and the extra advising goes into the debit column.

To test the hypothesis that keeping one's options open can have an affective cost, Gilbert and Ebert (2002) asked people to rate their liking for nine art posters and then told them they could have either their third- or fourth-highest ranked poster to take home. Participants in the changeable condition learned that if at any point in the next month they wanted to change their minds, they could exchange the poster they had chosen for the other one, whereas participants in the unchangeable condition learned that their choice was final. As seen in Table V, people in the unchangeable condition subsequently ranked their choice of poster more favorably than people in the changeable condition did. They "made the best" of their choice, given that they could not change their minds.

Forecasters asked to predict how they would rate the posters under changeable or unchangeable conditions did not anticipate this effect of irrevocability; they predicted that they would like their chosen poster

equally under changeable or unchangeable conditions. Finally, an additional group of participants read a description of the study and chose whether they would prefer to be in the changeable or unchangeable condition. Most participants chose the changeable condition, just as in everyday life people often prefer to retain the ability to change their mind later. In the Gilbert and Ebert study, however, this was the condition that resulted in less satisfaction with one's choice. If our goal is to maximize our satisfaction with a chosen alternative, it may be best not to keep our options open.

### C. MINOR INSULTS, LASTING PAINS

Suppose that homeowners were asked whether they would rather have something minor go wrong with their house, such as a screen door that develops loose hinges and does not close properly, or something major, such as a furnace that stops working in the middle of winter. This seems like an absurd question; who would rather experience a major problem than a minor one? The question is not so silly, however, when we take into account people's motivation to fix problems of different degrees of seriousness. When the furnace conks out in the middle of winter, homeowners call the heating and plumbing contractor immediately, and it is fixed as soon as possible. People are less motivated to fix minor problems; loose hinges, leaky faucets, and broken light switches can annoy people for months or years, because they never get around to repairing them. Ironically the net amount of discomfort caused by a minor problem might exceed that caused by a major problem.

The same paradox might apply to psychological traumas. Suppose we asked people whether they would rather be insulted by a close friend or a stranger. Again, this seems like an absurd question; an insult from a friend will surely hurt more than an insult from someone we don't know and will never see again. Suppose, however, that people are more motivated to "repair" the insult from the friend, by invoking their psychological defenses (e.g., "Sue didn't really mean it when she said my new haircut makes me look 5 years older; she must be having a bad day"). If they are able to defend against the insult from the friend successfully, the amount of pain it causes will be less than that caused by the insult from the stranger, which, precisely because it is less threatening, does not trigger psychological defenses to the same degree.

To test this hypothesis Gilbert, Lieberman, Morewedge, and Wilson (in press) placed participants in a situation in which they received negative personality feedback from another participant. Half of the participants

expected to meet and interact with the person who gave them the feedback whereas the other half believed they would never meet the person. When asked to predict how they would feel under these circumstances, forecasters said that they would feel worse if they received the negative feedback from the person they expected to meet. This prediction makes eminent sense; surely it would feel worse to be insulted by someone who we expect to meet and work with in a few minutes than by a stranger who we think we will never meet. As hypothesized, however, forecasters' predictions were wrong. People who actually received the negative feedback felt better when it came from the person they expected to meet than from the person they would never see. Presumably the insult from the never-to-be-seen stranger was too minor an annoyance to trigger the psychological immune system. It was strong enough to evoke some negative affect, but was not so important that people were motivated to repair it psychologically. The insult from the person people were about to meet was presumably more threatening, triggering a successful attempt to ameliorate its impact ("he was probably just pulling the experimenter's leg when he rated me so negatively; I bet he didn't mean it"). Minor insults can cause more lasting pains, if they do not trigger attempts to defend against them.

### D. THE TIMING OF RATIONALIZATION PROCESSES

Sometimes people know in advance that a negative event is likely to occur and it is to their advantage to get a head start on dealing with it psychologically. If Jane is certain that she will be laid off from her job next month, for example, she might prepare herself by devaluing her company and reconstruing it as a terrible place to work. Preemptive rationalization is risky, though, because if the negative event does not, in fact, occur, people have rained on their own parades. Suppose that Jane is wrong and that instead of being laid off, she is promoted to vice president. If she has convinced herself that the company is a poorly run, top-heavy behemoth that is sure to go bankrupt, she will get less pleasure from her achievement. There is a delicate trade-off between softening the blow of a future negative event by rationalizing it in advance and reserving judgment in case the negative event does not occur.

Wilson, Wheatley, Kurtz, Dunn, and Gilbert (2002) found that people are quite skilled at making this trade-off. As discussed earlier, participants took part in a simulated "dating game," in which they believed that they and a same-sexed student were competing for a hypothetical date with an opposite-sex student. The purpose of the study was ostensibly to test a computer program that analyzed information about the students and tried

to predict which of the two "contestants" the "date" would prefer. The contestant learned that the computer had assigned them a low or high probability of being chosen, and this probability was either moderate or extreme: The computer said that their probability of being chosen was 1.5% (extreme-low), 12% (moderate-low), 88% (moderate-high), or 98.5% (extreme-high). Before learning the date's actual choice, participants had the opportunity to examine positive and negative information about him or her, after which they learned the date's choice and rated their mood.

When given moderate probabilities (12% or 88%), people seemed to reserve judgment and avoid preemptive rationalization. Before learning the date's decision, for example, people in the 12% and 88% conditions did not differ in how long they looked at negative versus positive information. But, as soon as they learned whether the date had actually chosen them or the other contestant, they succeeded in rapidly reconstruing information about him or her in a direction consistent with the decision. Those who lost rated the date more negatively than those who won, and were least likely to recall positive information about him or her—regardless of whether they initially expected to win or lose. Thus, rather than run the risk of rationalizing too soon, and being wrong about what the outcome would be, people with moderate expectations waited until the date's actual choice was known and then selectively "spun" the information to make themselves feel better. The more people who lost reconstrued the date in a negative direction, for example, the better their mood. And, consistent with our prior work on immune neglect, forecasters did not anticipate that they would be able to rationalize a negative outcome so readily; they predicted that they would feel worse than experiencers reported feeling.

People given extreme probabilities (1.5% or 98.5%) engaged in a different strategy. Rather than reserving judgment, these participants engaged in preemptive rationalization whereby they began to reconstrue the date in anticipation of a loss or a win, before knowing his or her actual choice (Pyszczynski, 1982). People in the 1.5% condition, for example, spent the most time looking at negative information about the date relative to positive information. People in the 98.5% condition, in contrast, formed the most positive impressions of the date prior to learning his or her decision. Interestingly, they did so at a cost, if their expectations were violated. Participants in the 98.5% condition who found out they had lost the dating game were least successful at rationalizing this negative outcome after the fact, and were relatively unhappy afterward. By engaging in preemptive rationalization (e.g., focusing on the date's positive qualities) they seem to have made it more difficult for themselves to rationalize when they found out that the date did not choose them. In

sum, people generally made good decisions about when to prepare for affective events in advance by rationalizing and when to reserve judgment. In the unlikely case that an extreme expectation is violated, however (e.g., losing a date that was 98.5% certain), there is a cost to preemptive rationalization.

## E. THE PLEASURES OF UNCERTAINTY

We have just seen several intriguing consequences of the dynamics of the psychological immune system. We turn now to some implications of sense-making processes and emotional evanescence more generally, particularly in response to positive events. As seen earlier, one implication is that positive emotional reactions can be prolonged by interfering with people's sense-making abilities. Centerbar, Wilson, and Gilbert (2002) found that participants who had been chosen as the "best potential friend" by opposite-sex students were happiest the longest when they did not know which student had written the paragraphs explaining their choice. Wilson, Kermer, and Gilbert (2002) found that students who were given a dollar unexpectedly were happiest the longest when it was most difficult to explain why they had received the money.

Both of these studies manipulated people's ability to make sense of a positive event after it occurred. There are many times in life in which there is uncertainty about the nature of a positive event in advance, such as when people anticipate receiving a birthday present but do not know what it will be. Do people prefer to delay such uncertainty, or resolve it soon? Loewenstein (1987) noted that the anticipation of a positive event is itself pleasurable and has utility; for example, when asked when they would want to receive a kiss from their favorite movie star, participants preferred to wait a few days than receive the kiss right away, presumably to allow themselves the pleasure of anticipation. In these cases, however, people knew the exact nature of the event and thus knew what to savor. When there is uncertainty about what the event will be—imagine, for example, that people were told that they would get to kiss their favorite movie star or get a free ride in a hot air balloon—people generally prefer to resolve the uncertainty sooner rather than later. Lovallo and Kahneman (2000) found that people were willing to pay \$9, on average, to know the outcome of a positive gamble (e.g., whether they won \$1100 or \$100) sooner (the next day) rather than later (in 2 weeks). Loewenstein (1994) suggested that "curiosity is always aversive" and that "the process of satisfying curiosity is itself pleasurable" (p. 90).

The current conception of sense-making processes suggests a different hypothesis. As long as the valence of the outcome is known to be positive, people might be better off delaying the resolution of uncertainty. Imagine that people knew that they would win one of two attractive gifts, such as a camera or a compact disc player. As soon as they learn which gift they have won they begin to make sense of it; if they win the camera, for example, they alter their schemas accordingly, think about what they will do with it, and move on to think about other things. If people do not know which gift they will win this sense making is kept in check, and people might continue to think about the gifts and derive pleasure from these thoughts.

Wilson, Kurtz, and Gilbert (2002) tested this hypothesis by asking students to participate in a consumer attitudes study, in return for entering them in a lottery in which they could win attractive prizes (such as a camera, portable compact disc player, and a blender). The lottery was held in two stages. First, the students drew a slip of paper from a fish bowl to see if they had won a prize, ostensibly with a one-in-five chance of winning. All participants in fact won this stage of the lottery. Second, students wrote the names of their two most preferred prizes on slips of paper and randomly selected one, to find out which prize they had won. Participants in the certain condition did the second drawing right away and thus found out immediately what they had won. They were told that they would receive the prize when they returned for a second session held about 2 hours later. Participants in the uncertain condition were told that the second drawing, to determine which of their two favorite prizes they would win, would be held when they returned for the second session.

Participants in both conditions were relatively happy at the first session, after having found out that they would win a prize. There was no difference between the certain and uncertain conditions at this point; even though those in the latter condition did not yet know which prize they had won, they were as happy as people in the certain condition. By the end of the second session people in the certain condition had become less happy; presumably they had had ample time to "make sense" of which prize they had won. People's happiness increased slightly over time in the uncertain condition, resulting in a significant Condition  $\times$  Time interaction. Presumably thoughts about the prizes stayed alive more in the uncertain condition, given that they could not yet "resolve" what they had won.

We have no doubt that uncertainty is often an aversive state, especially when the valence of an outcome is unknown (e.g., whether an article will be accepted or rejected, or whether an investment has gained or lost money). As long as people know that the event is positive, however, a degree of uncertainty about it appears to prolong the pleasure people derive from it.

#### IV. Why Don't People Learn from Experience about the Impact Bias?

Given that the impact bias appears to be quite pervasive, why don't people learn about and correct for this bias over time? It might seem that as people experience life's successes and setbacks, they should come to recognize that their emotional reactions do not last as long as they expected. After suffering through the loss of several loved ones, for example, do people learn that "this, too, shall pass?" After achieving numerous professional milestones, do they take note of the fact that their pride and elation did not last as long as they expected, and correct their future forecasts accordingly?

It may not be as easy as it seems to learn about emotional evanescence. For example, there is evidence that people's memory for their past emotional reactions is poor, which would limit their ability to learn from these reactions (Christianson & Safer, 1996; Robinson & Clore, 2002). People often have to reconstruct how they felt in the past by consulting their current thoughts, feelings, and theories (Bem & McConnell, 1970; Gilovich & Medvec, 1995; Goethals & Reckman, 1973; Holmberg & Holmes, 1994; Ross, 1989; Ross & Newby-Clark, 1998; Wilson, Houston, & Meyers, 1998). Therefore, people's recall of the intensity and duration of past emotions might be subject to the same biases as predictions about future happiness. Under some conditions people might overestimate the impact that past events had on their emotions, committing a retrospective impact bias and preventing them from learning from their forecasting errors.

For example, people might be prone to the focalism bias when trying to recall how they felt after a specific event in the past. Just as people tend to think of a future event in a vacuum, neglecting to adjust for the many other events that are likely to occupy their thoughts and influence their happiness, so might people think of past events in a vacuum. Baseball fans might overestimate how happy they were after their favorite team won the World Series, for example, because they think about that event alone and neglect to adjust for the fact that at the time they were busy at work, occupied by family matters, and thinking about other sports. On the other hand, we have seen that novel, emotion-evoking events come to seem more ordinary over time, as people make sense of them. When the Cardinals win the World Series it seems wonderful and unexpected, but as time goes by and people make sense of it, the Cardinal's victory comes to seem less unexpected and amazing. When people think back to how they felt, they might be imagining an event (the inevitable Cardinal victory) that was different from the event they experienced at the time (the amazing, unexpected Cardinal victory).

One process, then, would seem to produce a retrospective impact bias (focalism), whereas another would seem to inhibit it (sense making). The net result might be an impact bias in retrospect that is smaller in magnitude than one that occurs in prospect. Before an event occurs both focalism and a failure to consider one's sense-making processes produce a large impact bias (e.g., "If the Cardinals win the World Series I'll be thrilled for days because all I will think about will be this momentous event"). When people try to recall how they felt after the event, focalism again occurs but the event itself seems less momentous (e.g., "It was nice when the Cardinals won and their victory dominated my thoughts, but they were destined to win it all that year").

We are aware of five studies that have tested for a retrospective impact bias and all found results that are consistent with this reasoning, at least for positive events. In three studies, Mitchell et al. (1997) assessed people's predicted enjoyment, actual enjoyment, and recalled enjoyment of vacation trips (e.g., a trip to Europe). Wilson, Meyers, and Gilbert (2002) asked Republicans to predict how they would feel after the 2000 presidential election was decided, how they actually felt after the election was settled in George W. Bush's favor, and 4 months later to recall how they had felt right after the election. In a second study Wilson, Meyers, and Gilbert (2002) asked forecasters to predict how they would feel if they did very well on a test of social aptitude. Experiencers took the test and were told that they had done very well, and then returned 1–3 weeks later and tried to recall how they had felt right after getting this positive feedback.

The results were remarkably consistent across the five studies. Participants showed a strong impact bias in prospect, predicting that they would have stronger emotional reactions than they in fact did. In all five studies participants also committed a retrospective impact bias, whereby after the event they overestimated how strong their reaction had been. But, in each case the retrospective impact bias was of a smaller magnitude than the prospective impact bias. In the Wilson, Meyers, and Gilbert (2002) election study, for example, Republicans' forecasts before the election were significantly greater than their recalled level of happiness after the election, though both were significantly higher than their actual level of happiness. These results are consistent with our reasoning that biases such as focalism can produce a retrospective impact bias, but that the magnitude of this bias is moderated by the fact that due to their sense-making processes, people recall an event that seems more ordinary than it did in prospect.

Even if people are able to recall correctly how they felt after an event they still might not learn from experience when making forecasts about similar events in the future. It is not enough to be able to recall how one felt in the past, people must also exert the effort to compare the future event (e.g., how

they will feel if their favorite baseball team wins the World Series) with relevant past events (e.g., how they felt the last time their team won the World Series). If people do not go to the trouble of searching their memory for past events to guide their predictions, but rather think about the future event in isolation, they obviously will not learn from their past experiences. Buehler and McFarland (2001), for example, found that people did not make very accurate forecasts about their reactions to future events, unless they were induced to think about similar events in the past. Finally, when people do consult their memories of past events, they need to decide which events are most applicable to the future event they are thinking about (Higgins, 1996; Koehler, 1996).

In a study by Wilson, Meyers, and Gilbert (2001), for example, people who learned that they had done quite well on a test of social aptitude were not as happy as they had anticipated they would be. Fifteen minutes later, these participants predicted how happy they would be after learning they had done equally well on several tests, including a different form of the same test they had just taken. They predicted that they would be quite happy, significantly more so than the level of happiness they had just experienced after doing well on the test, and as happy as control participants who had not received the earlier positive feedback—in short, they did not learn at all from their prior experience.

Although the evidence was indirect, Wilson, Meyers, and Gilbert (2001) assumed that the participants who had received the positive feedback had accurate recall of their prior feelings, given that they had received positive feedback on the test 15 minutes earlier. Presumably they also knew which of their prior experiences were most applicable to their forecasts, given that they were asked to predict how they would feel after doing well on a similar test in the future. The participants seem to have failed to meet the mental effort criterion, in that they apparently did not go to the trouble of consulting their earlier experiences when making their forecasts about their future ones. Perhaps if they were making forecasts that were more important to them than in these studies they would have gone to more of an effort to consult their prior experiences. At least at times, however, it is not sufficient to be able to recall how one felt in the past after similar events—people have to consult their memories and use this information when making forecasts about future events.

So far we have limited our discussion of learning from experience to positive events, such as doing well on a test or seeing one's favorite candidate win an election. As discussed earlier, when negative events occur people's sense-making processes are turbo charged by the psychological immune system, because people are motivated to reconstrue or rationalize the event in a way that makes them feel better about it.

Because of this increased tendency to reconstrue negative events, people might view the events in more neutral terms after they occur (e.g., after they have been "defanged" by their psychological immune system), and thus be less likely to commit a retrospective impact bias. For example, forecasters in a study by Wilson, Meyers, and Gilbert (2002) predicted that they would be quite unhappy if they did poorly on a test of social aptitude. When experiencers found out they had done poorly they engaged in considerable rationalization, reporting that the test was unfair and was measuring something trivial (compared to people who had done well, who reported that the test was quite fair, etc.). Consequently, participants did not feel nearly as badly as forecasters had predicted. A few weeks later, when the participants attempted to recall how they had felt right after doing poorly on the test, they were still rationalizing; they continued to rate the test as unfair and unimportant. Consequently, they recalled correctly that they had not been very unhappy when they found out that they had done poorly. In other words, because they were viewing the test through the lens of their rationalization ("the test was trivial and meaningless"), they concluded, correctly, that they must not have been upset at doing poorly.

Participants in this study were also asked to estimate how happy they would have predicted they would be right after taking the test, if they had been asked prior to taking it. If those who did poorly were viewing the test through the lens of their rationalization, then they should underestimate how badly they would have expected to feel in advance. Recall that forecasters had predicted that they would be very unhappy if they did poorly on the test. Those who really did do poorly, however, said that they would have predicted in advance that doing poorly would not bother them very much. Why? Forecasters (who had not taken the test) were imagining a devastating failure on a fair test of an important trait, whereas those who had done poorly were imagining an unfair test that assessed a trivial trait.

The upshot is that the people who did poorly had not really learned from experience that negative events sometimes do not make them feel as badly as they would have predicted. Instead, they came to view the test as less negative, and assumed (wrongly) that they would have predicted in advance that it would have little impact on them. Indeed, Wilson, Meyers, and Gilbert (2001) found that when these people were asked to predict how they would feel if they did poorly on different tests that they had not rationalized, they said that they would feel as negatively as did participants who had not done poorly. Thus, there was no evidence that participants had learned the general lesson that they are equipped with a powerful psychological immune system that will enable them to recover quickly from future negative events of all kinds.

## A. THE IMPACT BIAS OVER THE LIFE SPAN

The studies of learning from experience that we have discussed concerned single events in people's lives, such as presidential elections, vacations, and performance on tests. The question remains whether people learn over their life spans about emotional evanescence. Are older people less prone to the impact bias than younger people, as a result of having noticed that they recovered more quickly than expected from many life events? To find out, Wilson, Gilbert, and Salhouse (2001) asked a sample of people from ages 20 to 91 to read descriptions of 12 events and estimate (1) how easy it was for them to imagine that the events influenced them a set amount (e.g., 2 points on a happiness scale), (2) how they would feel right after the events occurred, and (3) how long it would take for their general happiness to return to the level it was before the events occurred. The events included both large, impactful ones, such as the death of a relative and winning a million dollars in the lottery, and small, commonplace ones, such as having a pleasant telephone chat with a friend and learning that a party they were looking forward to was canceled due to inclement weather.

There was no relationship between people's age and the ease with which they could imagine the events having an impact on them, suggesting that the events we chose were applicable to people of all ages. Nor were there any relationships between age and how people said they would feel right after the events; people of all ages said they would be very sad after the death of a loved one, for example, and very happy if they won a million dollars. There was, however, a relation between age and how long people said it would take for the emotional impact of the events to wear off. As seen in Fig. 4, there was a slight increase in the predicted duration of one's emotional reactions between ages 20 and 60, though this relationship was not strong;  $r = .17$ ,  $df = 129$ ,  $p = .06$ . After the age of 60 the trend reversed, such that the older the participants the less time they said it would take them to recover from emotion events,  $r = -.32$ ,  $df = 64$ ,  $p = .008$ . The quadratic trend shown in Fig. 4 was obtained when people predicted their reaction to both positive and negative events.

A trivial explanation of the downward slope after age 60 is that the older people are the less time they have left to experience the impact of major life events, thus they make shorter predictions. However, the negative correlation after age 60 was present for both major and minor life events (such as how long they thought it would take for the emotional impact of a social gathering at a friend's house to wear off). Further, the correlation remained when we truncated all predictions at one month, to minimize the possibility that younger people were predicting that the events would last for longer than the expected life span of the older people.

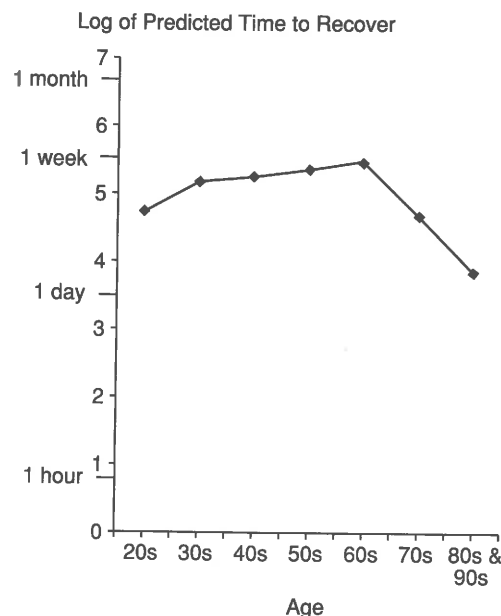


Fig. 4. Relationship of people's age to their predicted duration of emotional reactions to life events.

We confess that we do not have a ready-made explanation for the negative correlation after the age of 60, other than the possibility that it takes until that age for people to begin to learn from their many emotional experiences that they return to their emotional baseline relatively quickly. A limitation of the Wilson, Gilbert, and Salthouse (2001) study is that it examined predicted emotions only; there was no way of knowing how accurate these predictions were. In this light it is interesting to consider the results of a study of age and actual emotional experience by Carstensen, Pasupathi, Mayr, and Nesselroade (2000). People from ages 18 to 94 rated the degree to which they were feeling several different emotions at five, randomly chosen times a day for 1 week. There was a change in actual emotional experience that occurred at about the same time point (age 60) as the change we found in predicted emotional experience. When people were feeling more negatively than usual at one time point, Carstensen et al. computed the likelihood that they had "recovered" by the next time point and were feeling less negatively than usual. Between the ages of 18 and 60 there was a positive correlation between this recovery index and age; the older the participant, the more likely they were to have recovered from a negative emotional experience. However, from age 60 onward this trend

reversed slightly; the older people were, the longer it took them to recover from negative experiences (though the correlation was nonsignificant for people over 60).

It is striking that the age at which people seemed to become "wise" in the Wilson, Gilbert, and Salthouse (2001) study, predicting that emotional reactions to life events would not influence them for very long, is precisely the age at which negative emotional experiences began to increase in duration in the Carstensen et al. (2000) study. There were many differences between the two studies, of course, and it will take further research on adults across the life span to unravel the accuracy of people's affective forecasts. The available evidence suggests a curious disconnect between forecasts and experience from 60 onward that deserves a closer look.

### V. Is the Impact Bias Functional?

The pervasiveness of the impact bias, and the difficulty people seem to have in learning about it from experience, raises the question of whether the bias is functional in some way. It is easy to imagine that at times it is, such as for negative events over which people can exert some control. Overestimating the intensity and duration of negative outcomes can serve a self-regulatory function, motivating people to work hard in the present to prevent these outcomes from occurring in the future, such as a person who thinks, "If I do poorly on my statistics exam I will feel terrible for weeks; I better skip the party and go to the review session" (Mischel, Cantor, & Feldman, 1996). Research on defensive pessimism, for example, suggests that some people benefit from exaggerating the chances that negative consequences will occur, because it motivates them to prepare for the worst (e.g., Norem, 2001; Norem & Cantor, 1986; Rachman, 1994; Sanna, 1996). It is not to people's advantage to think, "I guess I'll stay in bed this morning and skip work; because after all, if I get fired my psychological immune system will succeed in making me feel OK about it."

Exaggerating the intensity and duration of reactions to positive events can also serve as a motivator, leading people to work harder to obtain these outcomes. Further, there is utility in anticipating positive events (Loewenstein, 1987), and people might thus enjoy exaggerating the pleasure they will experience in the future (e.g., "the concert will be a real peak experience").

Sometimes people have no control over future outcomes, however, such as the possibility that the large corporation that employs them is about to go bankrupt or that the college to which they have already applied will turn

them down. It does not seem as functional to overestimate the intensity and duration of one's negative emotional reactions when people cannot do anything to influence the outcome, especially given that doing so is likely to cause unnecessary worry and anxiety. People need to prepare for uncontrollable negative outcomes by engaging in proactive coping (Aspinwall, 1997; Taylor & Pham, 1996), such as by looking for another job or working hard on applications to other colleges, but it does not seem beneficial to exaggerate how badly one will feel if an uncontrollable event happens.

Even when events are controllable, the case could be made that people would be better off if they knew exactly how much pleasure or pain the events would cause, so that they could make wise decisions about how much effort to exert. Exaggerating the impact of events such as a job promotion might serve to increase people's motivation to work toward it, but why should people work hard toward something that will not bring as much gratification as they think? Wouldn't it be to people's advantage to have a better idea of the intensity and duration of the pleasure that they would derive from different events? Consider people who are thinking of buying an expensive consumer item such as a television set or new car. Part of the decision involves an affective forecast; people are willing to pay more for an item if they think it will cause lasting intense pleasure than if they think it will make them happy for only an hour or a day. If people commit the impact bias and overestimate how much pleasure a television set or new car will bring, they are paying more for these items than they should.

Further, the mechanisms that produce the impact bias, such as people's lack of appreciation of their sense-making abilities (including immune neglect), come with a cost. As we have seen, people sometimes arrange their environments in ways that lead to less happiness, such as keeping their options open when they would be better off making a final decision (Gilbert & Ebert, 2002) and reducing their uncertainty about pleasurable events (Centerbar, Wilson, & Gilbert, 2002).

Whether people are better off committing the impact bias is thus an open question. There has been very little research that has addressed this question directly, by, for example, examining the relationship between mental health indices and the propensity to commit the impact bias, as has been done with other kinds of illusions and biases (Taylor & Brown, 1988). The only evidence of which we are aware comes from the study of aging by Wilson, Gilbert, and Salthouse (2001). In this study the length of time that people said it would take them to recover from emotional events was positively correlated with a measure of depression (the Center for Epidemiologic Studies Depression Scale),  $r = .30$  for positive events,  $r = .22$  for negative events,  $ps < .005$ . It is unclear, of course, whether long predicted recovery times increased people's risk for depression, depression increased the

predicted amount of recovery time, or some third variable was positively correlated with both predicted recovery time and depression. Nonetheless these positive correlations are inconsistent with the hypothesis that the impact bias is functional.

## VI. Summary and Conclusions

Many important decisions are based on affective forecasts. Should we get married? Have a family? Pursue a career as musician or teacher? Go out to dinner or stay home and watch a made-for-television movie? Decisions such as these—indeed, virtually all important decisions—are based on predictions about how the different options will make us feel. People are skilled at predicting the valence of their future emotional reactions; if the choice is between going out to dinner or watching dogs be euthanized at the local animal shelter, most people would know which activity would be fun and which would not. People are also skilled at guessing the specific kinds of emotional reactions they will have, such as predicting whether an insult from a co-worker is more likely to cause anger, fear, or disgust. Predictions about valence and emotional specificity are not perfect; people sometimes underestimate the emotional complexity of an event or the predominant emotion they will experience, especially if they badly misconstrue what key elements of the situation will be like. In general, however, there is a good deal of accuracy to predictions about valence and specific emotions.

People are less accurate at predicting the intensity and duration of their future emotional reactions and we reviewed a number of mechanisms that can result in over- or underprediction. By far the most common error is the impact bias, the tendency to overestimate the enduring impact that future events will have on our emotional reactions. One reason for the impact bias is focalism, whereby people fail to anticipate the extent to which unrelated events will influence their thoughts and emotions, and thus overestimate the impact of the event they are considering. Perhaps the most prevalent cause of the impact bias is ordinization neglect, whereby people fail to anticipate the extent to which they will "ordinize" an event after it occurs, by automatically making sense of it. People are consummate sense makers who transform novel, emotion-producing events into ones that seem ordinary and mundane, through the processes of assimilation, accommodation, and explanation. Doing so reduces the emotional power of an event. By failing to take into account how rapidly such sense-making processes will occur, people overestimate the intensity and duration of their future emotional reactions.

People are especially motivated to “defang” negative events in ways that help them recover from the negative emotions they produce. They are equipped with a psychological immune system that often succeeds in rationalizing or reconstruing an event in a way that ameliorates its impact. Because the psychological immune system operates largely outside of conscious purview, people do not take it into account when predicting their future emotions, an error called immune neglect. People are thus especially likely to overestimate the emotional impact of negative events. We documented several consequences of immune neglect, including the belief that a benevolent external agent is controlling one’s behavior and the tendency to arrange our environments in ways that are not optimal for maximizing our happiness. We also examined evidence that people do not readily learn about and correct for the impact bias, which suggests that it may be functional in some way (such as motivating people to work to avoid negative events). We are not yet convinced that the impact bias is an altogether good thing, however, and believe that people would be better off if they could glimpse their many futures and predict well what their emotional reactions are likely to be.

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